Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Industrial Wastewater

BWP IW 38 & BWP IW 39

Permit for Industrial Sewer User

W204096
Transmittal Number

Facility ID# (if known)

DEP Use Only

Date Received

Important Instructions for Completing This Form

The questions on this form apply to existing and new facilities discharging industrial wastewater to sewers. If you are completing this form for an existing facility, answer the questions as they apply to its current status. If you are completing this form for a new facility, your answers will reflect your commitment to comply with the requirements as set forth in each question.

Existing facilities are defined as facilities in existence as of July 12, 2007. New facilities are defined as facilities constructed after July 12, 2007.

Answer all questions, except those that you are directed to skip. Please DO NOT answer questions that you are directed to skip

Permit Category (Select One)

☐ BWP IW 38: Industrial Sewer User in IPP POTW discharging more than 50,000 GPD

☒ BWP IW 39: Industrial Sewer User in Non-IPP POTW discharging more than 25,000 GPD

A. Facility Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Tufts University Cummings School of Veterinary Medicine
1a. Facility Name

200 Westborough Road
1b. Facility Address 1

1c. Facility Address 2

North Grafton | MA | 01536
1d. City | 1e. State | 1f. Zip Code

508-839-7921 | 508-839-7980
1g. Phone Number | 1h. Fax Number

042-103-634
1i. Federal Employer Tax Identification Number (FEIN or TIN)

Mailing Address: ☒ Check here if same as Facility Address and skip to Contact Information.

2a. Mailing Address: Street or P.O. Box

2b. Mailing Address 2

2c. City | 2d. State | 2e. Zip Code

Contact Information:

Joseph Chilton
3a. Contact Person Name

Director of Facilities
3b. Contact Person Title

508-839-7921 | N/A
3c. Phone Number | 3d. Extension

joseph.chilton-jr@tufts.edu
3e. Email Address

B. Industrial Wastewater Information

1. Project Description (Check All That Apply)

☐ 1a. New Construction

☐ 1b. Permit Renewal

☐ 1c. Increasing Flow From Existing Connection

☐ 1d. New or Modified Industrial Wastewater Pretreatment System (IWPS)

☒ 1e. Existing Unpermitted Connection (Constructed Before 7/12/07)

2. List, in descending order of significance, the Standard Industrial Classification (SIC) codes, which best describe the facility producing the discharge in terms of the principal products or services provided. Also, specify each classification title. (See Appendix B in the Instructions)

8221	University
2a. SIC Code	Description
0742	Veterinary Services
2b. SIC Code	Description
8733	Non commercial Research
2c. SIC Code	Description
8731	Commercial Physical & Biological Research
2d. SIC Code	Description

3. List all sewer connection(s) and their maximum daily flow(s) in gallons per day (GPD) from your facility going to the Publicly Owned Treatment Works (POTW):

	see attachment B-1	see attachment B-1	see attachment B-1	3d. Total Flow, All Connections
SANITARY	GPD	GPD	GPD	GPD
INDUSTRIAL	GPD	GPD	GPD	GPD
TOTAL	GPD	GPD	GPD	GPD

4. Are you in compliance with the Massachusetts Historical Commission requirements?

☒ Yes ☐ No* *If No, You Must Comply With Massachusetts Historical Commission Requirements **BEFORE** You Can Submit This Application.

5. Are you in compliance with Massachusetts Environmental Policy Act (MEPA) requirements?

☒ Yes ☐ No* *If No, You Must Comply With MEPA Requirements **BEFORE** You Can Submit This Application.

B. Industrial Wastewater Information (continued)

6. Check all pollutants that are present in your industrial wastewater **before** pretreatment, or if not treated, before discharge:

☐ 6a. Metals, Asbestos, Cyanide, Phenols

If Metals, Asbestos, Cyanide, or Phenols are present, provide concentrations in milligrams per liter (mg/L):

1. Antimony (total) (Sb)	mg/L	9. Nickel (total) (Ni)	mg/L
2. Arsenic (total) (As)	mg/L	10. Selenium (total) (Se)	mg/L
3. Beryllium (total) (Be)	mg/L	11. Silver (total) (Ag)	mg/L
4. Cadmium (total) (Cd)	mg/L	12. Thallium (total) (Tl)	mg/L
5. Chromium (hexavalent)	mg/L	13. Zinc (total) (Zn)	mg/L
6. Chrome (total) (Cr)	mg/L	14. Asbestos	mg/L
7. Copper (total) (Cu)	mg/L	15. Cyanide (total) (CN)	mg/L
8. Lead (total) (Pb)	mg/L	16. Phenols (total)	mg/L

☐ 6b. Toxic Pollutants (See Section 17B in the Instructions.)

If Toxic Pollutants are present, provide the total Toxic Pollutants concentration in micrograms per liter (ug/L):

6b1. Total Toxic Pollutants Concentration (ug/L)

NOTE: Use the **Toxic Pollutants Form** to list individual toxic chemicals and their concentrations.

☐ 6c. Total Petroleum Hydrocarbons (TPH) > 15 mg/L

☐ 6d. pH <5 and >10 Standard Units (S.U)

☒ 6e. Other*

*If Other Pollutants are present, describe them:

see Attachment B-2 for analytical results

B. Industrial Wastewater Information (continued)

7. Is Mercury (Hg) present in your industrial wastewater **before** pretreatment, or if not treated, before discharge?

☐ Yes ☒ No* *If No, skip to Question 8.

7a. If Yes, have you identified all possible mercury sources and taken all reasonable steps to eliminate the mercury?

☐ Yes* ☐ No *If Yes, skip to Question 8.

7b. If No, explain why.

N/A

NOTE: As of May 1, 2009, all facilities must meet a discharge limit of 1 part per billion (ppb) for Mercury.

8. What is the name of the Publicly Owned Treatment Works (POTW) that receives your wastewater? (See Appendix C in the Instructions.)

Grafton POTW
Name of POTW

9. Do you have a current sewer connection discharge permit or a current written approval issued by your local POTW? (See Section 17B in the Instructions.)

☒ Yes ☐ No* *If No, you must obtain either a permit or, if a permit is not required, a written approval from your local POTW to discharge **BEFORE** you can submit this application.

If you have a permit, provide the following information, then skip to Question 10.

9a. Permit Number

9b. Permit Expiration Date

If you have a written approval, provide the following information:

April 7, 2008 - See Attachment B-3
9c. Date of Approval Letter

David Therrien - Chairman
9d. Name of Person Who Signed the Letter

10. Are your POTW and local Sewer Authority the same entity? (See Section 17B in the Instructions.)

☒ Yes* ☐ No *If Yes, skip to Question 12.

B. Industrial Wastewater Information (continued)

11. Do you have a current sewer connection discharge permit or a current written approval issued by your local Sewer Authority? (See Section 17B in the Instructions.)

☐ Yes ☐ No* If No, you must obtain either a permit or written approval from your local Sewer Authority to discharge **BEFORE** you can submit this application.

If you have a permit, provide the following information, then skip to Question 12.

11a. Permit Number

11b. Permit Expiration Date

If you have a written approval, provide the following information:

11c. Date of Approval Letter

11d. Name of Person Who Signed the Letter

12. Is your facility currently classified as a Categorical Industrial User (CIU) pursuant to Federal Regulations? (See Appendix D in the Instructions.)

☐ Yes ☒ No* *If No, skip to Section C.

12a. List all the Categorical Pretreatment Standards applicable to your facility.

12a1. Part Number — Point Source Category

12a2. Part Number — Point Source Category

12a3. Part Number — Point Source Category

12a4. Part Number — Point Source Category

C. Industrial Wastewater Pretreatment System

1. Do you have an on-site industrial wastewater pretreatment system (IWPS) to treat your industrial wastewater?

☒ Yes ☐ No* *If No, skip to Section D.

1a. How many IWPSs do you have?

3
Number

NOTE: If you have more than one IWPS, please use an **Additional IWPS Form** for each additional IWPS.

1b. Provide a unique identifier (i.e. name) for this IWPS:

Building 20 - pH neutralization system (IWPS-1A)

C. Industrial Wastewater Pretreatment System (continued)

1c. What is the Total Design Capacity of this IWPS?

21,600 (15 gpm) (see Attachment C-1)
Gallons Per Day

1d. What is the Average Daily Flow of this IPWS? (Estimate if this is a new facility.)

2,500 - estimated based on lab use and familiarity with operations

1e. What is the Maximum Daily Flow of this IWPS? (Estimate if this is a new facility.)

5,000 - est. based on lab use and familiarity with operations; incl. flows from IWPS-1B

2. Is your IWPS designed and constructed to meet all local discharge standards and the applicable Categorical Industrial User (CIU) standards in 40 CFR Chapter I, Subchapter N?

☒ Yes ☐ No* *If No, you must take immediate steps to address the non-compliance **BEFORE** you can submit this application.

3. Does this IWPS treat hazardous industrial wastewater or hazardous industrial wastewater sludge as defined in 314 CMR 7.02?

☐ Yes ☒ No* *If No, skip to Question 12.

3a. Are you treating concentrated chemical baths, e.g. spent chemical baths, or off-specification products?

☐ Yes ☐ No* *If No, skip to Question 4.

3b. If Yes, describe the concentrated chemical baths you are treating.

4. Does your IWPS meet the requirements of "treatment which is an integral part of the manufacturing process" as defined in 310 CMR 30.010?

☐ Yes* ☐ No *If Yes, skip to Question 7.

5.Do you store hazardous industrial wastewater or hazardous industrial wastewater sludge that is generated in your IWPS or in your production processes, in tanks or containers?

Note: If you use in-ground tanks for storage of hazardous industrial wastewater or sludge and your IWPS is located in a Drinking Water Zone (see Section 17C of the Instructions; reference language in 310 CMR 30.605), you are not eligible to apply for a BWP IW 38 or BWP IW 39 permit. You must use form BWP IW 40 instead.

☐ Yes ☐ No* *If No, skip to Question 7.

C. Industrial Wastewater Pretreatment System (continued)

6. Are you in compliance with the requirements for tanks and containers in 310 CMR 30.342 and 343? (See Section 17C in the Instructions)

☐ Yes ☐ No* *If No, you must take immediate steps to address the non-compliance **BEFORE** you can submit this application.

7. Do you have a U.S. Environmental Protection Agency (EPA) hazardous waste generator identification number?

☐ Yes ☐ No* *If No, skip to Question 7b.

7a. What is your EPA identification number?

_____ Skip to Question 8.
EPA ID #

7b. Explain why you do not have an EPA identification number.

_____

_____

_____

8. Do you have a visible sign in place that warns against unauthorized entry into the IWPS area?

☐ Yes* ☐ No *If Yes, skip to Question 9.

8a. Explain why you do not have a visible sign in place.

_____

_____

_____

9.Do you have the required spill containment for the IWPS? (See Section 17C in the Instructions.)

☐ Yes* ☐ No *If Yes, skip to Question 10.

9a. Explain why you do not have the required spill containment.

_____

_____

_____

10. Is your IWPS located on land subject to flooding from a 100-year storm? (See Section 17C in the Instructions.)

☐ Yes ☐ No* *If No, skip to Question 12.

C. Industrial Wastewater Pretreatment System (continued)

11. Are you in compliance with the flood-proofing provisions in 310 CMR 30.701(2)? (See Section 17C in the Instructions.)

☐ Yes ☐ No* *If Yes, skip to Question 12.

11a. Explain why you are not in compliance with the flood-proofing provisions in 310 CMR 30.701(2).

12. What type of IWPS do you have? (Check all that apply.)

☐ Fully Automated Industrial Wastewater Pretreatment System (FAIWPS)

☒ Continuous Discharge IWPS ☐ Batch IWPS

13. Is the IWPS exempt from classification? (See Section 17C in the Instructions.)

☐ Yes* ☒ No *If Yes, skip to Question 14.

13a. What is the classification of this IWPS? (See 257 CMR 2.13: Classification of Wastewater Treatment Facilities.)

☒ Class 1I ☐ Class 2I ☐ Class 3I

☐ Class 4I ☐ Class 5 or 6C ☐ Class 1M

☐ Class 2M ☐ Class 3M ☐ Class 4M

13b. How was the IWPS' classification determined?

☐ In accordance with the requirements in 314 CMR 7.05(2)(g) 4. c. or d.

☐ By the Board of Certification of Operators of Wastewater Treatment Facilities

☒ Both

14. Is the IWPS staffed in accordance with the requirements of 314 CMR 7.05(2)(g) 5? (See Section 17C in the Instructions.)

☒ Yes* ☐ No *If Yes, skip to Question 15.

C. Industrial Wastewater Pretreatment System (continued)

14a. Explain why the IWPS is not staffed in accordance with 314 CMR 7.05(2)(g) 5.

N/A

15. Is this your first permit application under Permit Category BWP IW 38 or BWP IW 39 for this IWPS? Or, is this application a request for modification of this IWPS that currently has a BWP IW 38 or BWP IW 39 permit?

☒ Yes* ☐ No

*If Yes, you need to submit as an attachment the process flow diagram and description of the principal treatment processes for your IWPS. Otherwise, skip to Question 17.

16. How many attachments are included with this application in response to Question 15?

1 - see attachment C-2
Number of Attachments

17. Have your sewer connection and IWPS been designed and constructed in compliance with the design and construction standards as set forth in 314 CMR 7.05(2)(g)3?

☒ Yes ☐ No*

*If No, skip to Question 17b.

17a. What is the Massachusetts Registered Professional Engineer (MAPE) signature date on the engineering plans?

10-14-87
Date

Skip to Question 18.

17b. Explain why your sewer connection and IWPS have not been designed and constructed in compliance with the design and construction standards as set forth in 314 CMR 7.05(2)(g)3.

18. Provide the following information about the Massachusetts Registered Professional Engineer (MAPE) who reviewed, stamped, and signed your engineering plans:

A. Eugene Sullivan
18a. Name

617-523-8227
18b. Phone Number

9177
18c. Mass. P.E. License Number

Sanitary
18d. Mass. P.E. Specialty

C. Industrial Wastewater Pretreatment System (continued)

19. Do you have an IWPS operation and maintenance manual that complies with the procedures and other requirements in 314 CMR 7.05(2)(g)6.?

☒ Yes* ☐ No *If Yes, skip to Question 20.

19a. Explain why you do not have the required IWPS operation and maintenance manual.

20. Are you keeping your IWPS operation and maintenance manual current?

☒ Yes ☐ No

21. Are you implementing your IWPS operation and maintenance manual?

☒ Yes ☐ No

D. Monitoring, Reporting & Recordkeeping

1. Are you keeping your currently effective sewer discharge permit(s), IWPS plan(s), and current operation and maintenance manual(s) (as applicable) on-site at all times?

☒ Yes* ☐ No * If Yes, skip to Question 2.

1a. Explain why you are not keeping these records on-site at all times.

2. Are you keeping all your required records including your wastewater monitoring and analyses records, operation and maintenance records and logs, bills of lading, summary reports of all incidents requiring implementation of the safety plan, and hazardous waste manifests (as applicable) on-site for at least three years?

☒ Yes* ☐ No * If Yes, skip to Question 3.

2a. Explain why you are not keeping these records on-site for at least three years.

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Industrial Wastewater

Additional IWPS Form

Use With BWP IW 38 & BWP IW 39

W204096
Transmittal Number

Facility ID# (if known)

Permit Code

Instructions: Submit a completed copy of this form for each additional Industrial Wastewater Pretreatment System (IWPS) not identified on your BWP IW 38/BWP IW 39 permit application.

Industrial Wastewater Pretreatment System (IWPS) Information

NOTE: Question numbers on this form are identical with those on the BWP IW 38/BWP IW 39 permit application or Industrial Sewer Connection Certification forms. Questions 1 and 1a have been intentionally omitted.

1b. Please provide a unique identifier (i.e. name) for this IWPS:

Building 21 - pH neutralization system (IWPS-2)

1c. What is the Total Design Capacity of this IWPS?

14,400 (see Attachment C-1)
Gallons Per Day

1d. What is the Average Daily Flow of this IPWS? (Estimate if this is a new facility.)

1,000 - estimated on lab use and familiarity with operations

1e. What is the Maximum Daily Flow of this IWPS? (Estimate if this is a new facility.)

2,000 - estimated on lab use and familiarity with operations

2. Is your IWPS designed and constructed to meet all local discharge standards and the applicable Categorical Industrial User (CIU) standards in 40 CFR Chapter I, Subchapter N?

☒ Yes ☐ No* *If No, you must take immediate steps to address the non-compliance **BEFORE** you can submit this application.

3. Does this IWPS treat hazardous industrial wastewater or hazardous industrial wastewater sludge as defined in 314 CMR 7.02?

☐ Yes ☒ No* *If No, skip to Question 12.

3a. Are you treating concentrated chemical baths, e.g. spent chemical baths, or off-specification products?

☐ Yes ☐ No* *If No, skip to Question 4.

3b. If Yes, describe the concentrated chemical baths you are treating:

IWPS Information (continued)

4. Does your IWPS meet the requirements of "treatment which is an integral part of the manufacturing process" as defined in 310 CMR 30.010?

☐ Yes* ☐ No *If Yes, skip to Question 7.

5.Do you store hazardous industrial wastewater or hazardous industrial wastewater sludge that is generated in your IWPS or in your production processes and stored in tanks or containers?

Note: If you use in-ground tanks for storage of hazardous industrial wastewater or sludge and your IWPS is located in a Drinking Water Zone (see Section 17C of the Instructions; reference language in 310 CMR 30.605), you are not eligible to apply for a BWP IW 38 or BWP IW 39 permit. You must use form BWP IW 40 instead.

☐ Yes ☐ No* *If No, skip to Question 7.

6. Are you in compliance with the requirements for tanks and containers in 310 CMR 30.342 and 343? (See Section 17C in the Instructions)

☐ Yes ☐ No* *If No, you must take immediate steps to address the non-compliance **BEFORE** you can submit this application.

7. Do you have a U.S. Environmental Protection Agency (EPA) hazardous waste generator identification number?

☐ Yes ☐ No* *If No, skip to Question 7b.

7a. What is your EPA identification number?

_____ Skip to Question 8.
EPA ID #

7b. Explain why you do not have an EPA identification number.

_____

_____

_____

8. Do you have a visible sign in place that warns against unauthorized entry into the IWPS area?

☐ Yes* ☐ No *If Yes, skip to Question 9.

8a. Explain why you do not have a visible sign in place.

_____

_____

_____

Additional IWPS Information (continued)

9.Do you have the required spill containment for the IWPS? (See Section 17C in the Instructions.)

☐ Yes* ☐ No *If Yes, skip to Question 10.

9a. Explain why you do not have the required spill containment.

10. Is your IWPS located on land subject to flooding from a 100-year storm? (See Section 17C in the Instructions.)

☐ Yes ☐ No* *If No, skip to Question 12.

11. Are you in compliance with the flood-proofing provisions in 310 CMR 30.701(2)? (See Section 17C in the Instructions.)

☐ Yes* ☐ No *If Yes, skip to Question 12.

11a. Explain why you are not in compliance with the flood-proofing provisions in 310 CMR 30.701(2).

12. What type of IWPS do you have? (Check all that apply.)

☐ Fully Automated Industrial Wastewater Pretreatment System (FAIWPS)

☒ Continuous Discharge IWPS ☐ Batch IWPS

13. Is the IWPS exempt from classification? (See Section 17C in the Instructions.)

☐ Yes* ☒ No *If Yes, skip to Question 14.

13a. What is the classification of this IWPS? (See 257 CMR 2.13: Classification of Wastewater Treatment Facilities.)

☒ Class 1I	☐ Class 2I	☐ Class 3I
☐ Class 4I	☐ Class 5 or 6C	☐ Class 1M
☐ Class 2M	☐ Class 3M	☐ Class 4M

Additional IWPS Information (continued)

13b. How was the IWPS' classification determined?

☐ 13b1. In accordance with the requirements in 314 CMR 7.05(2)(g) 4. c. or d.

☐ 13b2. By the Board of Certification of Operators of Wastewater Treatment Facilities

☒ 13b3. Both

14. Is the IWPS staffed in accordance with the requirements of 314 CMR 7.05(2)(g) 5? (See Section 17C in the Instructions.)

☒ Yes* ☐ No *If Yes, skip to Question 15.

14a. Explain why the IWPS is not staffed in accordance with 314 CMR 7.05(2)(g) 5.

N/A

15. Is this your first permit application under Permit Category BWP IW 38 or BWP IW 39 for the IWPS? Or, is this application a request for modification of the IWPS that currently has a BWP IW 38 or BWP IW 39 permit?

☒ Yes* ☐ No *If Yes, you need to submit as an attachment the process flow diagram and description of the principal treatment processes for your IWPS.

16. How many attachments are included with this application in response to Question 15?

2 - See Attachments C-2 & C-3
Number of Attachments

17. Have your sewer connection and IWPS been designed and constructed in compliance with the design and construction standards as set forth in 314 CMR 7.05(2)(g)3?

☒ Yes ☐ No* *If No, skip to Question 17b.

17a. What is the Massachusetts Registered Professional Engineer (MAPE) signature date on the engineering plans?

2-14-95
Date

Skip to Question 18.

17b. Explain why your sewer connection and IWPS have not been designed and constructed in compliance with the design and construction standards as set forth in 314 CMR 7.05(2)(g)3.

18. Provide the name of the Massachusetts Registered Professional Engineer (MAPE) who reviewed, stamped, and signed your engineering plans:

Aldo Ruggieri 18a. Name	N/A 18b. Phone Number
35537 18c. Mass. P.E. License Number	Plumbing 18d. Mass. P.E. Specialty

19. Do you have an IWPS operation and maintenance manual that complies with the procedures and other requirements in 314 CMR 7.05(2)(g)6.?

☒ Yes* ☐ No *If Yes, skip to Question 20.

19a. Explain why you do not have an IWPS operation and maintenance manual.

20. Are you keeping your IWPS operation and maintenance manual current?

☒ Yes ☐ No

21. Are you implementing your IWPS operation and maintenance plan manual?

☒ Yes ☐ No

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Industrial Wastewater

Additional IWPS Form

Use With BWP IW 38 & BWP IW 39

W204096
Transmittal Number

Facility ID# (if known)

Permit Code

Instructions: Submit a completed copy of this form for each additional Industrial Wastewater Pretreatment System (IWPS) not identified on your BWP IW 38/BWP IW 39 permit application.

Industrial Wastewater Pretreatment System (IWPS) Information

NOTE: Question numbers on this form are identical with those on the BWP IW 38/BWP IW 39 permit application or Industrial Sewer Connection Certification forms. Questions 1 and 1a have been intentionally omitted.

1b. Please provide a unique identifier (i.e. name) for this IWPS:

Building 20 - Disinfection System (IWPS-1B)
Identifier/Name

1c. What is the Total Design Capacity of this IWPS?

3,840 (see Attachment C-1)
Gallons Per Day

1d. What is the Average Daily Flow of this IPWS? (Estimate if this is a new facility.)

1,000 - estimated based on lab use and familiarity with operations

1e. What is the Maximum Daily Flow of this IWPS? (Estimate if this is a new facility.)

2,000 - estimated based on lab use and familiarity with operations

2. Is your IWPS designed and constructed to meet all local discharge standards and the applicable Categorical Industrial User (CIU) standards in 40 CFR Chapter I, Subchapter N?

☒ Yes ☐ No* *If No, you must take immediate steps to address the non-compliance **BEFORE** you can submit this application.

3. Does this IWPS treat hazardous industrial wastewater or hazardous industrial wastewater sludge as defined in 314 CMR 7.02?

☒ Yes ☐ No* *If No, skip to Question 12.

3a. Are you treating concentrated chemical baths, e.g. spent chemical baths, or off-specification products?

☐ Yes ☒ No* *If No, skip to Question 4.

3b. If Yes, describe the concentrated chemical baths you are treating:

IWPS Information (continued)

4. Does your IWPS meet the requirements of "treatment which is an integral part of the manufacturing process" as defined in 310 CMR 30.010?

☒ Yes* ☐ No *If Yes, skip to Question 7.

5.Do you store hazardous industrial wastewater or hazardous industrial wastewater sludge that is generated in your IWPS or in your production processes and stored in tanks or containers?

Note: If you use in-ground tanks for storage of hazardous industrial wastewater or sludge and your IWPS is located in a Drinking Water Zone (see Section 17C of the Instructions; reference language in 310 CMR 30.605), you are not eligible to apply for a BWP IW 38 or BWP IW 39 permit. You must use form BWP IW 40 instead.

☐ Yes ☐ No* *If No, skip to Question 7.

6. Are you in compliance with the requirements for tanks and containers in 310 CMR 30.342 and 343? (See Section 17C in the Instructions)

☐ Yes ☐ No* *If No, you must take immediate steps to address the non-compliance **BEFORE** you can submit this application.

7. Do you have a U.S. Environmental Protection Agency (EPA) hazardous waste generator identification number?

☒ Yes ☐ No* *If No, skip to Question 7b.

7a. What is your EPA identification number?

MAD991304718 Skip to Question 8.
EPA ID #

7b. Explain why you do not have an EPA identification number.

8. Do you have a visible sign in place that warns against unauthorized entry into the IWPS area?

☒ Yes* ☐ No *If Yes, skip to Question 9.

8a. Explain why you do not have a visible sign in place.

Additional IWPS Information (continued)

9.Do you have the required spill containment for the IWPS? (See Section 17C in the Instructions.)

☒ Yes* ☐ No *If Yes, skip to Question 10.

9a. Explain why you do not have the required spill containment.

10. Is your IWPS located on land subject to flooding from a 100-year storm? (See Section 17C in the Instructions.)

☐ Yes ☒ No* *If No, skip to Question 12.

11. Are you in compliance with the flood-proofing provisions in 310 CMR 30.701(2)? (See Section 17C in the Instructions.)

☐ Yes* ☐ No *If Yes, skip to Question 12.

11a. Explain why you are not in compliance with the flood-proofing provisions in 310 CMR 30.701(2).

12. What type of IWPS do you have? (Check all that apply.)

☒ Fully Automated Industrial Wastewater Pretreatment System (FAIWPS)

☐ Continuous Discharge IWPS ☐ Batch IWPS

13. Is the IWPS exempt from classification? (See Section 17C in the Instructions.)

☐ Yes* ☒ No *If Yes, skip to Question 14.

13a. What is the classification of this IWPS? (See 257 CMR 2.13: Classification of Wastewater Treatment Facilities.)

☒ Class 1I	☐ Class 2I	☐ Class 3I
☐ Class 4I	☐ Class 5 or 6C	☐ Class 1M
☐ Class 2M	☐ Class 3M	☐ Class 4M

Additional IWPS Information (continued)

13b. How was the IWPS' classification determined?

☐ 13b1. In accordance with the requirements in 314 CMR 7.05(2)(g) 4. c. or d.

☐ 13b2. By the Board of Certification of Operators of Wastewater Treatment Facilities

☒ 13b3. Both

14. Is the IWPS staffed in accordance with the requirements of 314 CMR 7.05(2)(g) 5? (See Section 17C in the Instructions.)

☒ Yes* ☐ No *If Yes, skip to Question 15.

14a. Explain why the IWPS is not staffed in accordance with 314 CMR 7.05(2)(g) 5.

15. Is this your first permit application under Permit Category BWP IW 38 or BWP IW 39 for the IWPS? Or, is this application a request for modification of the IWPS that currently has a BWP IW 38 or BWP IW 39 permit?

☒ Yes* ☐ No *If Yes, you need to submit as an attachment the process flow diagram and description of the principal treatment processes for your IWPS.

16. How many attachments are included with this application in response to Question 15?

2 - See Attachments C-4 & C-5
Number of Attachments

17. Have your sewer connection and IWPS been designed and constructed in compliance with the design and construction standards as set forth in 314 CMR 7.05(2)(g)3?

☒ Yes ☐ No* *If No, skip to Question 17b.

17a. What is the Massachusetts Registered Professional Engineer (MAPE) signature date on the engineering plans?

6/23/03
Date

Skip to Question 18.

17b. Explain why your sewer connection and IWPS have not been designed and constructed in compliance with the design and construction standards as set forth in 314 CMR 7.05(2)(g)3.

18. Provide the name of the Massachusetts Registered Professional Engineer (MAPE) who reviewed, stamped, and signed your engineering plans:

Alfred Melchionda	781-372-3000
18a. Name	18b. Phone Number
34857	Plumbing
18c. Mass. P.E. License Number	18d. Mass. P.E. Specialty

19. Do you have an IWPS operation and maintenance manual that complies with the procedures and other requirements in 314 CMR 7.05(2)(g)6.?

☒ Yes* ☐ No *If Yes, skip to Question 20.

19a. Explain why you do not have an IWPS operation and maintenance manual.

20. Are you keeping your IWPS operation and maintenance manual current?

☒ Yes ☐ No

21. Are you implementing your IWPS operation and maintenance plan manual?

☒ Yes ☐ No

D. Monitoring, Reporting & Recordkeeping (continued)

3. [Reserved for Toxics Reporting]

Additional reporting requirements will be added to this section in the future.

E. General & Specific Prohibitions

1. After carefully reviewing all of the general and specific prohibitions listed below, are you in compliance with these General and Specific Prohibitions?

☒ Yes* ☐ No *If Yes, read Section F and then complete Section G.

1a. Identify all the prohibitions you are not in compliance with and explain why. Attach an additional sheet of paper to this form, if necessary.

1. General Prohibitions. The permittee shall not:

a. Discharge, or cause to be discharged to a POTW, any substances, materials, or wastewater that may:

i. harm the sewers, POTW wastewater treatment process or equipment;
ii. have an adverse impact on the receiving waters; or
iii. otherwise create a nuisance or endanger public health, safety, or the environment.

b. Introduce pollutants into POTWs that pass through the POTW or interfere with its operation or performance.

c. Discharge wastewater or allow discharge of wastewater through any sewer connection that would result in a hazard to the public health or safety.

d. Discharge bypass wastewater or allow discharge of bypass wastewater through any sewer connection. If bypassing due to an emergency condition occurs, the Department and POTW shall be notified in accordance with 314 CMR 7.04(3). Such notification or its acknowledgement shall not be construed as permission by the Department or POTW to discharge bypass wastewater.

e. Discharge hazardous waste or allow the discharge of hazardous waste through any sewer connection.

2. Specific Prohibitions. The permittee shall not introduce into a POTW or its wastewater collection system the following:

a. Pollutants which may create a fire, explosion, or other hazard in the POTW or its wastewater collection system.

b. Pollutants which may cause corrosive structural damage to the POTW or its wastewater collection system. In no case shall discharges with a pH lower than 5.0 Standard Unit (S.U) or more than 10.0 S.U. be allowed, unless the local limit allows such discharges.

c. Solid or viscous pollutants in amounts which may cause obstruction to the flow in the POTW or its wastewater collection system or may result in interference.

d. Any pollutant, including oxygen-demanding pollutants, discharged at a flow rate or pollutant concentration that will cause interference with the POTW or its wastewater collection system.

e. Heat in amounts which may inhibit biological activity in the POTW, resulting in interference. In no case shall heat in such quantities that the temperature at the POTW treatment plant exceeds 40° C (104° F) be discharged, unless the Department, upon request of the POTW, approves alternate temperature limits.

F. Additional Conditions

a. All discharges shall be in compliance with the terms and conditions of this permit. The discharge of any wastewater at a level in excess of that identified and authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such a violation may result in the imposition of civil and/or criminal penalties as provided for in M.G.L. c.21, Section 42.

b. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

i. Violation of any terms or conditions of the permit;

ii. Obtaining a permit by misrepresentation or failure to disclose fully all relevant facts; or

iii. A change in conditions or the existence of a condition, which requires either a temporary or permanent reduction, or elimination of the authorized discharge.

c. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges; nor does it authorize or relieve the permittee of any liability for any injury to private property or any invasion of personal rights; nor any infringement of Federal, State, or local laws or regulations; nor does it waive the necessity of obtaining any local assent required by law for the discharge authorized herein by the Department.

d. The provisions of this permit are severable, and the invalidity of any condition or subdivision thereof shall not make void any other condition or subdivision thereof.

e. All information and data provided by an applicant or a permittee identifying the nature and frequency of a discharge shall be available to the public without restriction. All other information (other than effluent data) which may be submitted by an applicant in connection with a permit application shall also be available to the public unless the applicant or permittee is able to demonstrate that the disclosure of such information or particular part thereof to the general public would divulge methods or processes entitled to protection as trade secrets in accordance with the provisions of M.G.L. c.21, Section.27(7). Where the applicant or permittee is able to so demonstrate, the Department shall treat the information or the particular part (other than effluent data) as confidential and not release it to any unauthorized person. Such information may be divulged to other officers, employees, or authorized representatives of the Commonwealth or the United States Government concerned with the protection of public water or water supplies.

f. Transfer of Permits. Any sewer system connection permit authorizing an industrial discharge to a sewer system is only valid for the person to whom it is issued, unless prior to transfer:

i. The current permittee notifies the Department in writing at least 30 days in advance of the proposed transfer date; and

ii. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibilities, and liability to the new permittee.

g. This permit authorizing the discharge expires five (5) years from the date of issuance. The permittee shall apply for a renewal of this permit at least ninety (90) days prior to the expiration date, in accordance with 314 CMR 7.09(3)(b) for continued lawful discharges beyond the expiration date.

h. All solids, sludge, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be collected, treated, and disposed of in accordance with applicable provisions in the following:

i. Hazardous waste regulations (310 CMR 30.000).

ii. Solid waste regulations (310 CMR 19.00).

iii. Sewer discharge regulations (314 CMR 7.00).

iv. Any other applicable federal, state and local laws.

i. All samples shall be analyzed by a Massachusetts Certified Laboratory.

j. The permittee shall provide the Department, and the Department's employees, authorized representatives and contractors, access at to the facility at all reasonable times, including during wastewater treatment system operation or wastewater discharge, for purposes of conducting activities related to oversight of this permit, including inspections to monitor compliance with the terms herein. The permittee shall allow the Department to obtain information related to compliance with the requirements of this permit. Notwithstanding any provision of this permit, the Department retains all of its access authorities and rights under applicable state and federal law.

G. Certification Statement

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true accurate, and complete. I certify that this facility is in compliance with all conditions and requirements of this permit, and all applicable statutes and regulations. I further certify that systems to maintain compliance are in place at the facility or unit and will be maintained even if processes or operating procedures are changed. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment of knowing violations."

(I will be responsible for publication of public notice of the applicable permit proceedings identified under 314 CMR 2.06(1)(a) through (d).)

Joseph Chilton
Printed Name of Applicant

Director of Facilities
Title

Signature of Applicant

5-21-08
Date Signed

Wayne E. Bates, PhD, PE
Name of Preparer

Engineering Manager
Title

508-970-0033
Phone Number

MassDEP Use Only

Special Conditions:

This document is a permit issued pursuant to Massachusetts General Laws, Chapter 21, Section 43 and Massachusetts regulations at 314 CMR 7.00. The permittee shall comply with all of the provisions contained in the permit application which are hereby incorporated and made part of this permit.

Date Issued

Permit Effective Date

Permit Expiration Date

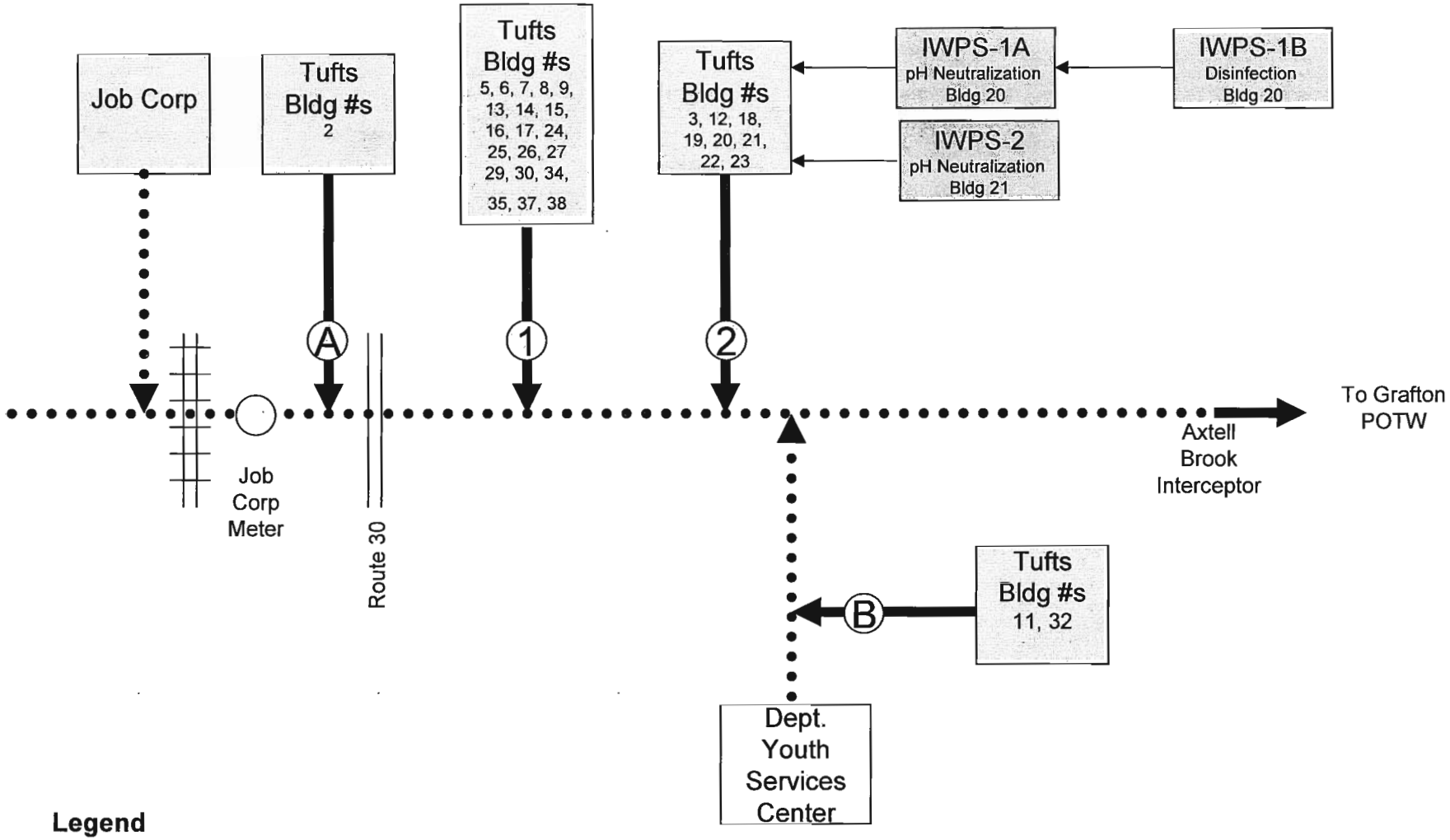
Name of Regional BWP Section Chief

Signature

Attachment B-1
Maximum Daily Flows + Sewer Connection Figures

Connection Number	A	B	1	2	Total Flow
Report Reference Tables	*1B*	*4B*	*2B*	*3B*	
	GPD	*GPD*	*GPD*	*GPD*	*GPD*
Sanitary	2,250	8,055	43,705	3,450	57,460
Industrial	750	0	795	6,800	8,345
Total	3,000	8,055	44,500	10,250	65,805

Figure 1: Buildings discharging to each connection
Figure 2: Site Plan
Figure 3: Site Plan showing sewer connections



Legend

- (A) Unmetered sewer connection
- (1) Metered sewer connection
- rail road tracks
- Tufts Univ. sewer main
- Town sewer main

Figure 1 - Sewer Connections

Tufts University
Cummings School of Veterinary Medicine
North Grafton, MA

Date: 12-28-2007

Scale: NTS3

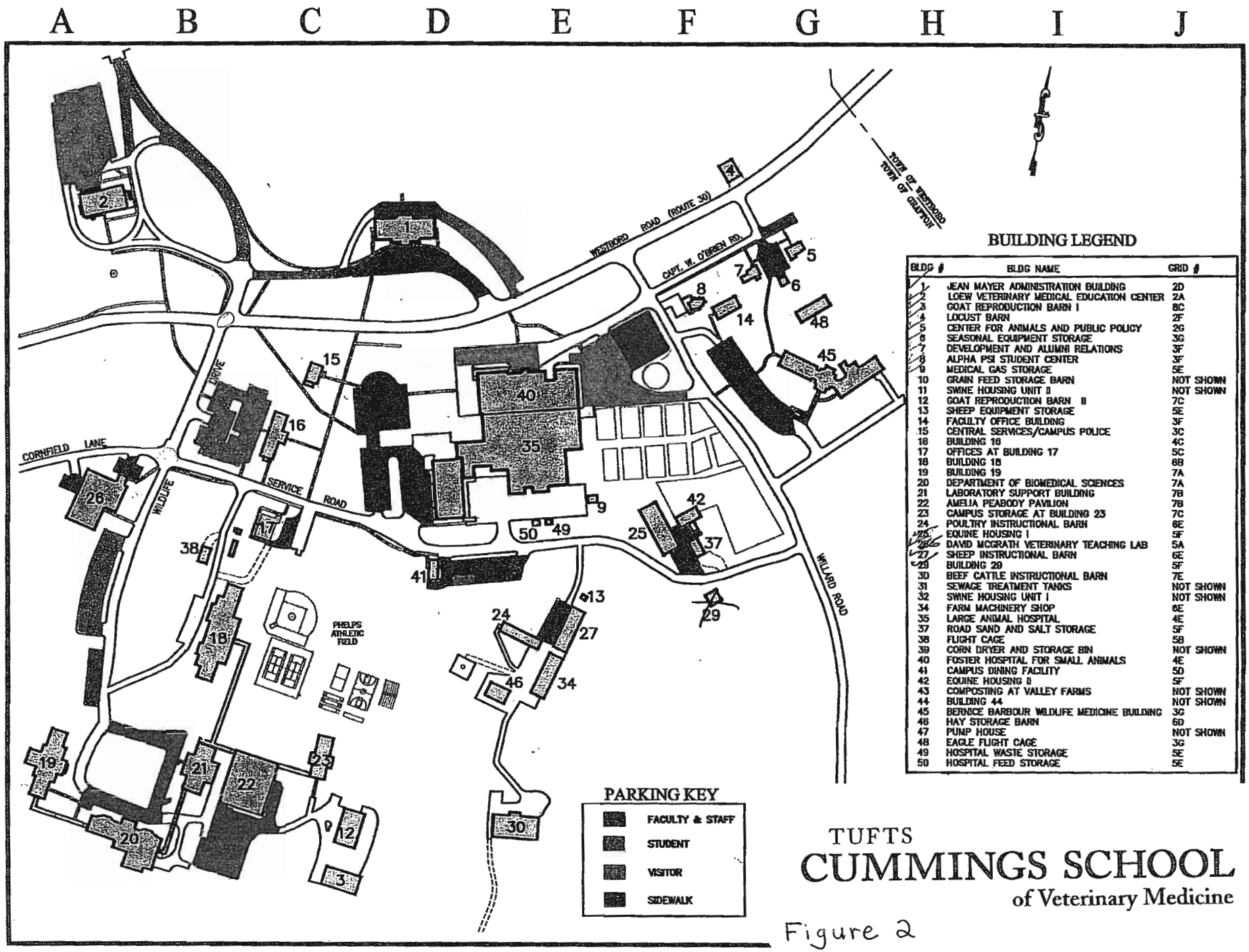
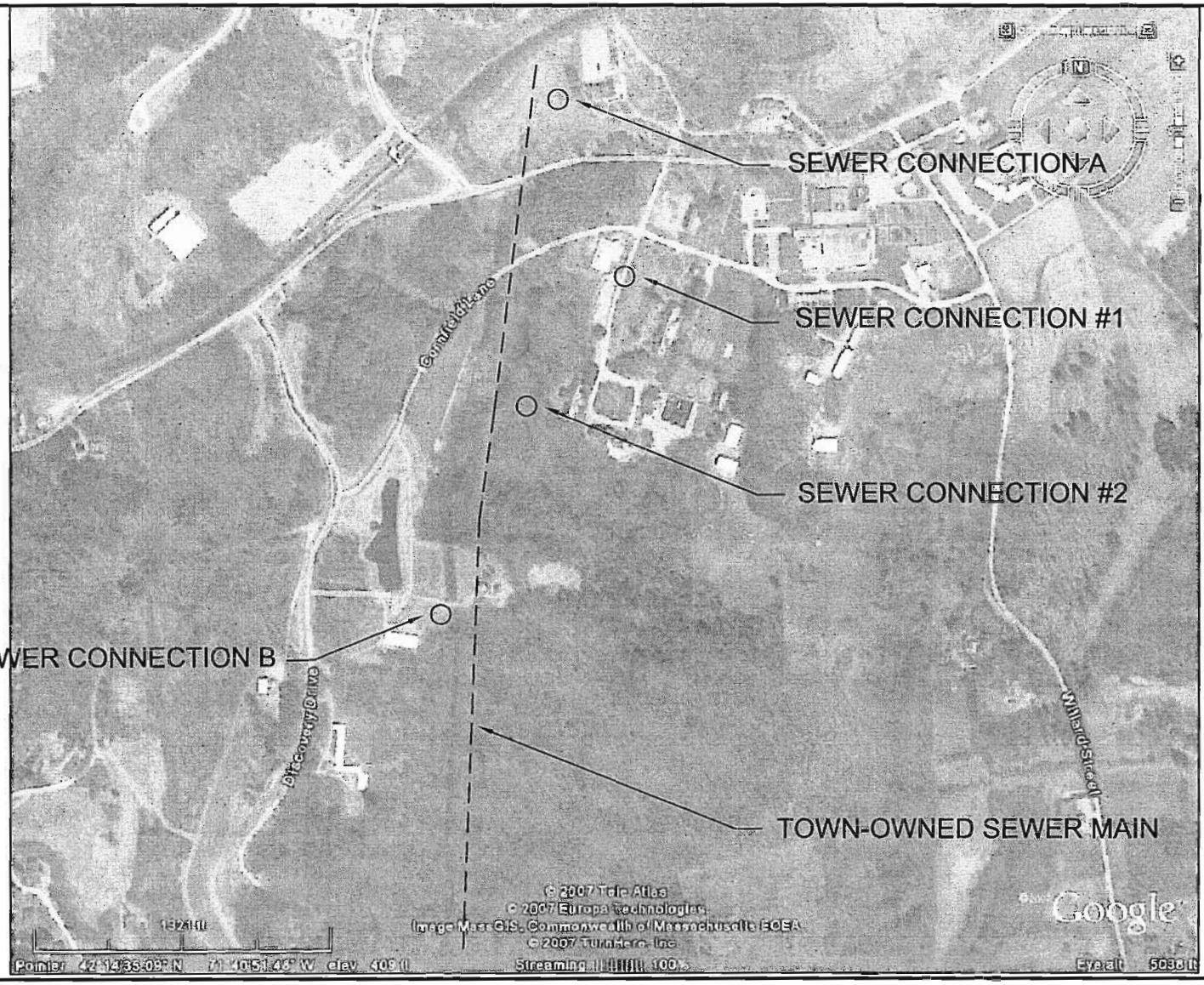

A B C D E F G H I J
1 2 3 4 5 6 7 8
WESTBORO ROAD (ROUTE 30)
CAPT. W. O'BRIEN RD.
TOWN OF WESTBORO
TOWN OF GRAFTON
CORNFIELD LANE
WILDLIFE DRIVE
SERVICE ROAD
WILLARD ROAD
PHELPS ATHLETIC FIELD
BUILDING LEGEND
BLDG # | BLDG NAME | GRID #
1 JEAN MAYER ADMINISTRATION BUILDING 2D
2 LOEW VETERINARY MEDICAL EDUCATION CENTER 2A
3 GOAT REPRODUCTION BARN I 8C
4 LOCUST BARN 2F
5 CENTER FOR ANIMALS AND PUBLIC POLICY 2G
6 SEASONAL EQUIPMENT STORAGE 3G
7 DEVELOPMENT AND ALUMNI RELATIONS 3F
8 ALPHA PSI STUDENT CENTER 3F
9 MEDICAL GAS STORAGE 5E
10 GRAIN FEED STORAGE BARN NOT SHOWN
11 SWINE HOUSING UNIT II NOT SHOWN
12 GOAT REPRODUCTION BARN II 7C
13 SHEEP EQUIPMENT STORAGE 5E
14 FACULTY OFFICE BUILDING 3F
15 CENTRAL SERVICES/CAMPUS POLICE 3C
16 BUILDING 16 4C
17 OFFICES AT BUILDING 17 5C
18 BUILDING 18 6B
19 BUILDING 19 7A
20 DEPARTMENT OF BIOMEDICAL SCIENCES 7A
21 LABORATORY SUPPORT BUILDING 7B
22 AMELIA PEABODY PAVILION 7B
23 CAMPUS STORAGE AT BUILDING 23 7C
24 POULTRY INSTRUCTIONAL BARN 6E
25 EQUINE HOUSING I 5F
26 DAVID MCGRATH VETERINARY TEACHING LAB 5A
27 SHEEP INSTRUCTIONAL BARN 6E
29 BUILDING 29 5F
30 BEEF CATTLE INSTRUCTIONAL BARN 7E
31 SEWAGE TREATMENT TANKS NOT SHOWN
32 SWINE HOUSING UNIT I NOT SHOWN
34 FARM MACHINERY SHOP 6E
35 LARGE ANIMAL HOSPITAL 4E
37 ROAD SAND AND SALT STORAGE 5F
38 FLIGHT CAGE 5B
39 CORN DRYER AND STORAGE BIN NOT SHOWN
40 FOSTER HOSPITAL FOR SMALL ANIMALS 4E
41 CAMPUS DINING FACILITY 5D
42 EQUINE HOUSING II 5F
43 COMPOSTING AT VALLEY FARMS NOT SHOWN
44 BUILDING 44 NOT SHOWN
45 BERNICE BARBOUR WILDLIFE MEDICINE BUILDING 3G
46 HAY STORAGE BARN 6D
47 PUMP HOUSE NOT SHOWN
48 EAGLE FLIGHT CAGE 3G
49 HOSPITAL WASTE STORAGE 5E
50 HOSPITAL FEED STORAGE 5E
PARKING KEY
FACULTY & STAFF
STUDENT
VISITOR
SIDEWALK
TUFTS
CUMMINGS SCHOOL
of Veterinary Medicine

Figure 2



CLIENT: Tufts University - Cummings School of Veterinary Medicine	Figure 3	NORTH	SIZE: A
TITLE: Sewer Connection Locations 200 Westboro Rd, North Grafton, MA	SCALE: Approx. 1" = 700'-0" JOB # 06-046 DATE: 12-28-07	DR BY:TJL CK BY:WEB REV: -	

Capaccio
Environmental Engineering, Inc.
293 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

Attachment B-2
Laboratory Analytical Results

ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive
Westborough, Massachusetts 01581-1019
(508) 898-9220 www.alphalab.com
MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

Client: Capaccio Environmental Engineering
Address: 293 Boston Post Road
Marlboro, MA 01752
Attn: Mr. Wayne Bates
Project Number:

Laboratory Job Number: L0719024
Date Received: 21-DEC-2007
Date Reported: 09-JAN-2008
Delivery Method:
Site: UNTREATED WASTEWATER

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0719024-01	BUILDING 20 COMPOSITE	200 WESTBORO RD, GRAFTON
L0719024-02	BUILDING 20 GRAB	200 WESTBORO RD, GRAFTON
L0719024-03	BUILDING 21 COMPOSITE	200 WESTBORO RD, GRAFTON
L0719024-04	BUILDING 21 GRAB	200 WESTBORO RD, GRAFTON

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by: Michelle M. Morris
Technical Representative

ALPHA ANALYTICAL LABORATORIES
NARRATIVE REPORT

Laboratory Job Number: L0719024

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0719024-01
BUILDING 20 COMPOSITE
Sample Matrix: WATER

Date Collected: 21-DEC-2007 12:00
Date Received : 21-DEC-2007
Date Reported : 09-JAN-2008

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 2-Amber,2-Plastic

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Chromium, Hexavalent	ND	mg/l	0.010	30 3500CR-D	1221 20:00	1221 20:00	HS
Total Metals				19 200.7			
Antimony, Total	ND	mg/l	0.050	19 200.7	0106 13:00	0109 10:39	AI
Arsenic, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0109 10:39	AI
Beryllium, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0109 10:39	AI
Cadmium, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0109 10:39	AI
Chromium, Total	ND	mg/l	0.01	19 200.7	0106 13:00	0109 10:39	AI
Copper, Total	0.046	mg/l	0.010	19 200.7	0106 13:00	0109 10:39	AI
Lead, Total	ND	mg/l	0.010	19 200.7	0106 13:00	0109 10:39	AI
Nickel, Total	ND	mg/l	0.025	19 200.7	0106 13:00	0109 10:39	AI
Selenium, Total	ND	mg/l	0.010	19 200.7	0106 13:00	0109 10:39	AI
Silver, Total	ND	mg/l	0.007	19 200.7	0106 13:00	0109 10:39	AI
Thallium, Total	ND	mg/l	0.020	19 200.7	0106 13:00	0109 10:39	AI
Zinc, Total	ND	mg/l	0.050	19 200.7	0106 13:00	0109 10:39	AI

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number:	L0719024-02	Date Collected:	21-DEC-2007 12:00
	BUILDING 20 GRAB	Date Received :	21-DEC-2007
Sample Matrix:	WATER	Date Reported :	09-JAN-2008
Condition of Sample:	Satisfactory	Field Prep:	None

Number & Type of Containers: 2-Vial

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID

******* THIS SAMPLE IS ON HOLD *******

Not analyzed based on operator knowledge.

Wayne S. Bal

01-10-08

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number:	L0719024-03	**Date Collected:**	21-DEC-2007 12:15
	BUILDING 21 COMPOSITE	**Date Received :**	21-DEC-2007
Sample Matrix:	WATER	**Date Reported :**	09-JAN-2008
Condition of Sample:	Satisfactory	**Field Prep:**	None

Number & Type of Containers: 2-Amber,2-Plastic

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Chromium, Hexavalent	ND	mg/l	0.010	30 3500CR-D	1221 20:00	1221 20:00	HS
Total Metals				19 200.7			
Antimony, Total	ND	mg/l	0.050	19 200.7	0106 13:00	0109 10:43	AI
Arsenic, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0109 10:43	AI
Beryllium, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0109 10:43	AI
Cadmium, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0109 10:43	AI
Chromium, Total	ND	mg/l	0.01	19 200.7	0106 13:00	0109 10:43	AI
Copper, Total	0.052	mg/l	0.010	19 200.7	0106 13:00	0109 10:43	AI
Lead, Total	ND	mg/l	0.010	19 200.7	0106 13:00	0109 10:43	AI
Nickel, Total	ND	mg/l	0.025	19 200.7	0106 13:00	0109 10:43	AI
Selenium, Total	ND	mg/l	0.010	19 200.7	0106 13:00	0109 10:43	AI
Silver, Total	ND	mg/l	0.007	19 200.7	0106 13:00	0109 10:43	AI
Thallium, Total	ND	mg/l	0.020	19 200.7	0106 13:00	0109 10:43	AI
Zinc, Total	0.068	mg/l	0.050	19 200.7	0106 13:00	0109 10:43	AI

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number:	L0719024-04	Date Collected:	21-DEC-2007 12:15
	BUILDING 21 GRAB	Date Received :	21-DEC-2007
Sample Matrix:	WATER	Date Reported :	09-JAN-2008
Condition of Sample:	Satisfactory	Field Prep:	None

Number & Type of Containers: 2-Vial

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID

******* THIS SAMPLE IS ON HOLD *******

Not analyzed based on operator knowledge.

Wayne E. Bu

01-10-08

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0719024

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Chromium, Hexavalent for sample(s) 01,03 (L0719015-01, WG306761-3)					
Chromium, Hexavalent	ND	ND	mg/l	NC	20
Total Metals for sample(s) 01,03 (L0719015-01, WG307786-1)					
Antimony, Total	ND	ND	mg/l	NC	
Arsenic, Total	ND	ND	mg/l	NC	
Beryllium, Total	ND	ND	mg/l	NC	
Cadmium, Total	ND	ND	mg/l	NC	
Chromium, Total	ND	ND	mg/l	NC	
Copper, Total	ND	ND	mg/l	NC	
Lead, Total	ND	ND	mg/l	NC	
Nickel, Total	ND	ND	mg/l	NC	
Selenium, Total	ND	ND	mg/l	NC	
Silver, Total	ND	ND	mg/l	NC	
Thallium, Total	ND	ND	mg/l	NC	
Zinc, Total	0.116	0.123	mg/l	6	

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0719024

Parameter	% Recovery	QC Criteria
Chromium, Hexavalent LCS for sample(s) 01,03 (WG306761-2)		
Chromium, Hexavalent	98	85-115
Total Metals LCS for sample(s) 01,03 (WG307786-4)		
Antimony, Total	100	
Arsenic, Total	109	
Beryllium, Total	100	
Cadmium, Total	112	
Chromium, Total	95	
Copper, Total	90	
Lead, Total	103	
Nickel, Total	100	
Selenium, Total	109	
Silver, Total	92	
Thallium, Total	102	
Zinc, Total	103	
Chromium, Hexavalent SPIKE for sample(s) 01,03 (L0719015-01, WG306761-4)		
Chromium, Hexavalent	101	85-115
Total Metals SPIKE for sample(s) 01,03 (L0719015-01, WG307786-2)		
Antimony, Total	97	
Arsenic, Total	108	
Beryllium, Total	97	
Cadmium, Total	110	
Chromium, Total	95	
Copper, Total	93	
Lead, Total	101	
Nickel, Total	96	
Selenium, Total	111	
Silver, Total	94	
Thallium, Total	99	
Zinc, Total	103	

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0719024

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Blank Analysis for sample(s) 01,03 (WG306761-1)							
Chromium, Hexavalent	ND	mg/l	0.010	30 3500CR-D	1221 20:00	1221 20:00	HS
Blank Analysis for sample(s) 01,03 (WG307786-3)							
Total Metals				19 200.7			
Antimony, Total	ND	mg/l	0.050	19 200.7	0106 13:00	0108 11:41	AI
Arsenic, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0108 11:41	AI
Beryllium, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0108 11:41	AI
Cadmium, Total	ND	mg/l	0.005	19 200.7	0106 13:00	0108 11:41	AI
Chromium, Total	ND	mg/l	0.01	19 200.7	0106 13:00	0108 11:41	AI
Copper, Total	ND	mg/l	0.010	19 200.7	0106 13:00	0108 11:41	AI
Lead, Total	ND	mg/l	0.010	19 200.7	0106 13:00	0108 11:41	AI
Nickel, Total	ND	mg/l	0.025	19 200.7	0106 13:00	0108 11:41	AI
Selenium, Total	ND	mg/l	0.010	19 200.7	0106 13:00	0108 11:41	AI
Silver, Total	ND	mg/l	0.007	19 200.7	0106 13:00	0108 11:41	AI
Thallium, Total	ND	mg/l	0.020	19 200.7	0106 13:00	0108 11:41	AI
Zinc, Total	ND	mg/l	0.050	19 200.7	0106 13:00	0108 11:41	AI

REFERENCES

19. Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

GLOSSARY OF TERMS AND SYMBOLS

REF	Reference number in which test method may be found.
METHOD	Method number by which analysis was performed.
ID	Initials of the analyst.
ND	Not detected in comparison to the reported detection limit.
NI	Not Ignitable.
ug/cart	Micrograms per Cartridge.
H	The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

ALPHA Job # L0719024

Chain of Custody Record

EST, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Container Type
P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type
1. Wastewater
2. Groundwater
3. Soil
4. Drinking Water
5. Surface Water
6. Storm Water
7. Other _____

Laboratory: Alpha Analytical Labs (508) 898-9220

Lab Invoice To: Tufts Grafton
Lab Report To: wbates@capaccio.com

EST Invoice To: Tufts Grafton
7921-JEC-xx

Site: Tufts University Grafton
Address: 200 Westboro Road
Grafton MA 01536-
Contact: Joe Chilton
Phone #: (508) 839-7921
Description: *Untreated Wastewater Sampling*

Client: Tufts University Grafton
Address: 200 Westboro Road
Grafton MA 01536-
Contact: Joe Chilton
Phone #: (508) 839-7921
Fax #:

☐ Rush
____Day Turnaround
☐ Routine

LOCATION (Sample Identification)	Sample Type	Container Size	Container Type	Container #	Sampling Date	Sampling Time	Preservative *	Laboratory Analysis	Notes
Building 20 Composite	1	500 ml	P	1	12/20-21	1330-1200	HNO3	Sb,As,Be,Cd,Cr,Cu,Pb,Ni,Se,Ag,Tl,Zn	pH = 7.29
Building 20 Composite	1	500 ml	P	1	↓	↓	None	CrVI	Temp = 19.8
Building 20 Composite	1	1 L	G	2	↓	↓	None	625*Lab to HOLD analysis per Capaccio	
Building 20 Grab	1	40 ml	V	2	12/21	1200	Na2S2O3	624*Lab to HOLD analysis per Capaccio	
Building 21 Composite	1	500 ml	P	1	12/20-21	1345-1215	HNO3	Sb,As,Be,Cd,Cr,Cu,Pb,Ni,Se,Ag,Tl,Zn	pH = 7.49
Building 21 Composite	1	500 ml	P	1	↓	↓	None	CrVI	Temp = 14.2
Building 21 Composite	1	1 L	G	2	↓	↓	None	625*Lab to HOLD analysis per Capaccio	
Building 21Grab	1	40 ml	V	2	12/21	1215	Na2S2O3	624*Lab to HOLD analysis per Capaccio	

Sampler's Name (Print)	Signature	DATE	TIME
Matt Gould	Matt Gould	12/21/07	1215

Additional Comments:

NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	Matt Gould	Paul Gilbert	12/21/07	1630
2	Paul Gilbert		12/21	1800
3				
4				
5				

*All samples chilled to 4 degrees celsius.

Attachment B-3
Letter of Agreement with Town of Grafton Sewer Commission

Town of Grafton
Board of Sewer Commissioners
Grafton Memorial Municipal Center
30 Providence Road
Grafton, Massachusetts 01519
508 839-4435 x185

April 8, 2008

Mr. Joseph Chilton
Tufts University
Cummings School of Veterinary Medicine
200 Westborough Road
Grafton MA 01536

RE: Permission to Discharge

Dear Mr. Chilton:

Tufts University, Cummings School of Veterinary Medicine (TUFTS) is authorized to discharge wastewater through the Town of Grafton Sewerage System to the Town of Grafton Sewer Treatment Plant.

The Board of Sewer Commissioners (BOARD) reserves the right to require TUFTS to reapply for permission to discharge based on potential changes to wastewater quantity and/or quality from existing or proposed operations.

Permission granted with this letter does not relieve TUFTS of its obligations to comply with other applicable local, state, and federal pretreatment laws, regulations, standards and requirements, including those that may become effective subsequent to the issuance of this letter.

APPROVED:
Board of Sewer Commissioners

By: David L. Therrien — 7 April 2008
David L. Therrien, Chairman — Date

Philip L. Platt — 7 April 2008
Philip L. Platt, Clerk — Date

Gerald L. LeBlanc — 7 April 2008
Gerald L. LeBlanc, Member — Date

TOWN OF GRAFTON

WASTEWATER TREATMENT FACILITY

CHARLES BOHABOY JR.
Superintendent of Sewers

Phone: 508.839.8526 fax: 508.839.8523
E-mail: wpcf@gis.net

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Wayne Bates	Paul Coumoyer
COMPANY:	**DATE:**
Capaccio Eng.	1 May 2008
FAX NUMBER:	**TOTAL NO. OF PAGES INCLUDING COVER:**
	2
PHONE NUMBER:	**SENDER'S REFERENCE NUMBER:**
RE:	**YOUR REFERENCE NUMBER:**

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Attachment C-1
Pretreatment System Design Calculation Sheet

Building 20 – pH Neutralization System

Tank Volume = 250 gal.
Detention Time = 15 min.

Q = V/t
= 250 gal / 15 min
= 16.7 gal/min

Assume System is designed to treat 15 gpm

15 gal/min * 60 min/hr * 24 hr/day = **21,600 gal/day**

Based on conversations with the wastewater operator, average daily flow through the system is approximately 2,500 gal/day with a maximum daily flow of approximately 5,000 gal/day in extreme cases.

Building 20 – Disinfection System

The disinfection system is designed with two 80 gallons each that run in parallel and have a cycle time of 60 minutes. Therefore the treatment system is capable of treating 160 gal/hr.

160 gal/hr * 24 hr/day = **3,840 gal/day**

Based on conversations with the wastewater operator, average daily flow through the system is approximately 1,000 gal/day with a maximum daily flow of approximately 2,000 gal/day in extreme cases.

Building 21 – pH Neutralization System

Tank Volume = 200 gal.
Detention Time = 15 min.

Q = V/t
= 200 gal / 15 min
= 13.3 gal/min

Assume System is designed to treat 10 gpm

10 gal/min * 60 min/hr * 24 hr/day = **14,400 gal/day**

Based on conversations with the wastewater operator, average daily flow through the system is approximately 1,000 gal/day with a maximum daily flow of approximately 2,000 gal/day in extreme cases.

Attachment C-2
Building 20 and 21 – pH Neutralization Systems

Enclosed as Attachment C-2 is a letter dated November 3, 2006 to Board of Wastewater Treatment Operators, which contains the following information:

- Building 20 pH Neutralization System (IWPS – 1A)
    - Description of system
    - Grading report
    - Process flow diagram

- Building 21 pH Neutralization System (IWPS – 2)
    - Description of system
    - Grading report
    - Process flow diagram

Capaccio
Environmental Engineering, Inc.

FILE COPY

"Helping Industry and the Environment Prosper"

VIA CERTIFIED MAIL
RETURN-RECEIPT REQUESTED: 7006 0100 0005 2867 4457

November 3, 2006

Board of Wastewater Treatment Plant Operators
Attention: Tom Bienkiewicz
Massachusetts Department of Environmental Protection
Central Regional Office
627 Main St.
Worcester, MA 01608

RE: Tufts Cummings School of Veterinary Medicine
200 Westboro Road
North Grafton, MA 01536
Industrial Wastewater Pretreatment Facility Grading Report
Project No. 06-046

Dear Mr. Bienkiewicz:

Capaccio Environmental Engineering, Inc. (CAPACCIO) is submitting this Industrial Wastewater Pretreatment (WWT) Facility Grading Report on behalf of our client, Tufts Cummings School of Veterinary Medicine (TUFTS). TUFTS accepts 80 new students each year in order to provide a modern veterinary education including research, diagnosis, and medical treatment of small and large domestic and wild animals.

TUFTS generates wastewater from its laboratories and animal cage washing operations located in Buildings 20 and 21. Wastewater is discharged from these operations to the Grafton Wastewater Treatment Plant following pH adjustment and effluent monitoring. TUFTS maintains two separate pH adjustment systems which handle waste from each building. The pH adjustment systems are located in Building 20 and Building 21. A description of each treatment system follows.

Building 20 – Wastewater from the laboratories and cage washing operations is discharged to a two-stage pH adjustment system consisting of two, 250-gallon tanks equipped with mixers, pH sensors, and pH controllers. The wastewater then flows by gravity to the building's sanitary sewer line (see figure number PFD-20-1).

The pH neutralization system operates on a continuous, flow-through basis. The system accepts incoming streams of aqueous solutions from laboratories located in the building and discharges treated liquids by gravity flow as new incoming liquid displaces volume in each tank. Wastewater enters Mix Tank T-01, which is a 250-gallon (185-gallon working volume) stage 1 neutralization tank. This tank is mixed by a top-entering agitator that rapidly disperses new incoming liquids and treatment chemicals to provide a high degree of uniformity of concentration in the tank. The liquid's pH is continuously measured by a sensor immersed in the tank. The sensor is connected to a microprocessor-based controller with full bi-directional proportional, integral and derivative control (PID). The controller automatically initiates treatment with sodium hydroxide via the appropriate metering pump when the measured pH exceeds the low set point

for the tank. The PID controller starts, stops, and directly regulates the pumping rate of the metering pump. A 50% sodium hydroxide solution is utilized to adjust the pH within tank T-01.

Treated wastewater overflows via a 4" polypropylene pipe and enters the Trim Tank, T-02, which is the second stage of pH adjustment. In tank T-02, sodium hydroxide or sulfuric acid is automatically injected into the tank via a metering pump based on wastewater pH. The liquid enters the 250-gallon (175-gallon working volume) neutralization tank and is mixed by a top-entering agitator that rapidly disperses new incoming liquids and treatment chemicals to provide a high degree of uniformity of concentration in the tank. The pH of the liquid in the tank is continuously measured by a sensor immersed in the tank. The sensor is connected to a microprocessor-based controller with full bi-directional proportional, integral and derivative control (PID). The controller automatically initiates treatment with the appropriate pump when the measured pH exceeds the high or low set points for the tank. The PID controller starts, stops, and directly regulates the pumping rate of each metering pump. The reagents used are 93% sulfuric acid (66 baumé) and 50% sodium hydroxide.

The discharge from the tank passes through a running u-trap with one extended leg. This trap has a pH sensor mounted within. This sensor continuously monitors the pH of the liquid discharge after treatment and records it on a circular chart recorder. High and low pH alarms provide visual indication of either a high or low pH condition on the control panel.

Building 21 – This pH neutralization system operates on a continuous, flow-through basis (see figure PFD-21-1). The system accepts incoming streams of aqueous solutions from laboratories located in the building and discharges treated liquids by gravity flow as new incoming liquid displaces volume in the tank. The liquid enters the 200 gallon (150 gallon working volume) neutralization tank and is mixed by a top-entering agitator which rapidly disperses all new incoming liquids and treatment chemicals to provide a high degree of uniformity of concentration in the tank. The pH of the liquid in the tank is continuously measured by a sensor immersed in the tank. The sensor is connected to a microprocessor based controller with full bi-directional proportional, integral and derivative control (PID). The controller automatically initiates treatment with the appropriate pump when the measured pH exceeds either of the two (high and low) set points for the tank. The PID controller starts, stops, and directly regulates the pumping rate of each metering pump. The reagents used are 93% sulfuric acid (66 baumé) and 50% sodium hydroxide.

The discharge from the tank passes through a running u-trap with one extended leg. This trap has a pH sensor mounted within. This sensor continuously monitors the pH of the liquid discharge after treatment and records it on a circular chart recorder. High and low pH alarms provide audible and visual alarm indication of either a high or low pH condition.

The treatment system in building 21 is located below grade; therefore, wastewater must be pumped to the existing sewer connection line. To achieve this, wastewater flows by gravity from the pH adjustment tank directly into a 90-gallon pump station. The pump station utilizes a ½ hp vertical centrifugal type pump connected to a float controller that automatically pumps wastewater in to the building's sanitary sewer line. When the float reaches a high level the pump activates and pumps down to the station's low level. A separate high level alarm float located in the pump station activates if tank liquid level increases above normal. If the high level float is activated for any reason, an audible and visual alarm activates on the pump control panel.

Based on the aforementioned descriptions of WWT system unit operations, and based on the Board Policy implemented on January 13, 1994 which states that pH Neutralization Systems which include only chemical addition, flow measurement, instrumentation, and pumping in plant shall command a rating of 3 to 4 points in our opinion we a score of 4 points for each of TUFTS' pH adjustment systems. This rating results in a grading level of 1-I for the wastewater treatment system located in Building 20 and a grading level of 1-I for the wastewater treatment system located in Building 21.

If you have any questions or require additional information, please call 508-970-0033 extension 34 for Seth Forden or extension 21 for Wayne Bates.

Very truly yours,
Capaccio Environmental Engineering, Inc.
BY:

Seth Forden
Environmental Engineer

Wayne E. Bates, PhD, PE
Manager, Engineering Group

Enclosures:
WWT Facility Grading Report
- Building 20
- Building 21

WWT Process Flow Schematic
- PFD-20-1
- PFD-21-1

cc:
J. Chilton (TUFTS)
W. Bates (CAPACCIO)
MF (06-046)

Building 20

MASSACHUSETTS BOARD OF CERTIFICATION
OF
WASTEWATER TREATMENT PLANT OPERATORS

FACILITY GRADING REPORT

Facility Name: Tufts Cummings School of Veterianary Med.			File No.	
Street Address: 200 Westboro Road				
City/Town: North Grafton		State: MA		Zip: 01536
Telephone: 508-839-7921				
Contact Name and Title: Joe Chilton, Facilities Manager				
Discharge Permit Numbers				
NPDES No.				
Date Received:				
Rating Results:		Date:		Approved:
Industrial or Municipal: Industrial				
Rating Total: 3-4				
Grade: II				

CLASS	CUMULATIVE RATING VALUE
Class (M or I)	1-7
Class 2 (M or I)	8-20
Class 3 (M or I)	21-30
Class 4 (M or I)	31-50
Class 5	51-65

RATING VALUES FOR CLASSIFICATION OF FACILITIES		
UNIT	RATING	SCORE
Aeration mechanical or diffused air greater than 0.5 MGD less than 0.5 MGD		
Aeration: sludge, reaeration		
Aeration: pure oxygen greater than 0.5 MGD		
BOD Removal		
* BOD removal Rating = $\frac{\text{Design BOD in Pounds/Day X "f"}}{1000}$ "f" = 0.3 for primary treatment and 0.8 for secondary or higher facilites		
Carbon Filter		
Carbon Reactivation		
Centrifuge		
Chemical Addition	2	4
Chlorination pre, gas or liquid		
Chlorination post, gas or liquid		
Clarifier, tube setting or inclined plate		
Clariflocculation		
Coagulation and Neutralization		
Comminutation		
Condenser		
Cooling Tower		
Dechlorination		
Denitrification		
Dissolved Air Flotation		
Electrodialysis		
Equalization		
Evaporators		
Extended Aeration; greater than 0.1 MGD less than 0.5 MGD		

Extended Aeration equal to or less than 0.1 MGD		
Flash Mixing		
Flow measurement		
Flocculation		
Grit Chamber Aerated		
Grit Chamber manually cleaned		
Grit Chamber mechanical grit removal		
Heat Exchangers		
High rate filtration units less than 0.1 MGD greater than 0.1 less than 0.5 MGD greater than 0.5 less than 0.1 MGD greater than 1.0 MGD		
Hypochlorite generation		
Hypochlorination pre and/or post		
Hydrocyclones (grit removal)		
Imhoff tanks		
Incineration		
Ion exchange		
Laboratory		
Land Irrigation, spraying		
Land Irrigation, direct discharge		
Membrane Filtration		
Nitrification		
Odor Control		
Oil Separation		
Oxidation Ditch		
Ozonation		
pH Neutralization System	3-4	4
Polishing Filter		
Post-aeration (cascade)		
Pre-aeration (mechanical)		
Primary Settling; airlift or manual sludge removal		
Primary Settling; mechanical sludge removal		
Primary Sludge holding and mixing		

Pumping (in plant)	3	3
Pumping stations under operator's control		
Reaction vessel		
Reverse Osmosis		
Rotating Biological Contactors		
Rotating Biological Contactors		
Rotary Drum Dryers		
Sand Filters; Multi media, automatic back wash		
Sand Filters; intermittent		
Sand Filters; polishing		
Sand Filters; subsurface		
Screens (mechanical)		
Scum Concentrator		
Secondary Settling; airlift or manual sludge removal		
Secondary Settling; mechanical sludge removal		
Septage facilities		
Sludge blending		
Sludge Composting		
Sludge drying Beds		
Sludge digestion; aerobic		
Sludge digestion; heated and mixed anaerobic		
Sludge digestion; heated and unmixed, anaerobic		
Sludge digestion; unheated		
Sludge elutriation		
Sludge incinerators		
Sludge press; belt		
Sludge press; plate and frame		
Sludge thickeners: floatation		
Stabilization ponds; non-aerated		
Stabilization ponds; aerated		
Stripping; air or steam		
Trickling Filters; high rate		
Trickling, Filters; staged		

Trickling Filters; standard rate	2	
Ultraviolet disinfection	2-5	
Vacuum Filter	10	
Wet Air Oxidation	10	
Board Policy:		
Board Policy:		
Comments: The sum of the cumulative points is 11; however, since these process operations are all encompassed under "pH adjustment system" the score should be 3 or 4 according to the Board Policy accpeted Jan. 13, 1994.		

Building 21

MASSACHUSETTS BOARD OF CERTIFICATION
OF
WASTEWATER TREATMENT PLANT OPERATORS

FACILITY GRADING REPORT

Facility Name: Tufts Cummings School of Veterianary Med.			File No.	
Street Address: 200 Westboro Road				
City/Town: North Grafton		State: MA		Zip: 01536
Telephone: 508-839-7921				
Contact Name and Title: Joe Chilton, Facilities Manager				
Discharge Permit Numbers				
NPDES No.				
Date Received:				
Rating Results:		Date:		Approved:
Industrial or Municipal: Industrial				
Rating Total: 3-4				
Grade: 1I				

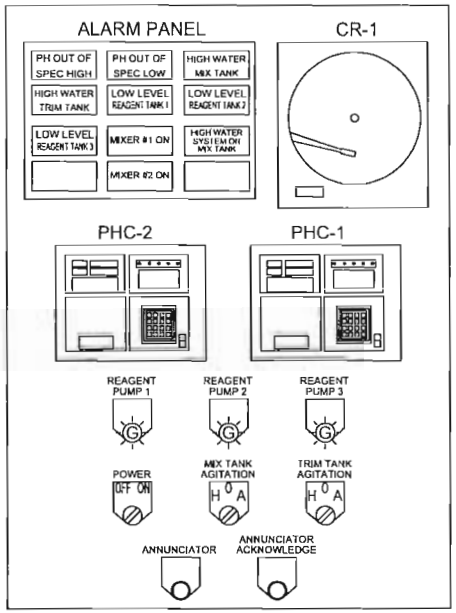
CLASS	CUMULATIVE RATING VALUE
Class (M or I)	1-7
Class 2 (M or I)	8-20
Class 3 (M or I)	21-30
Class 4 (M or I)	31-50
Class 5	51-65

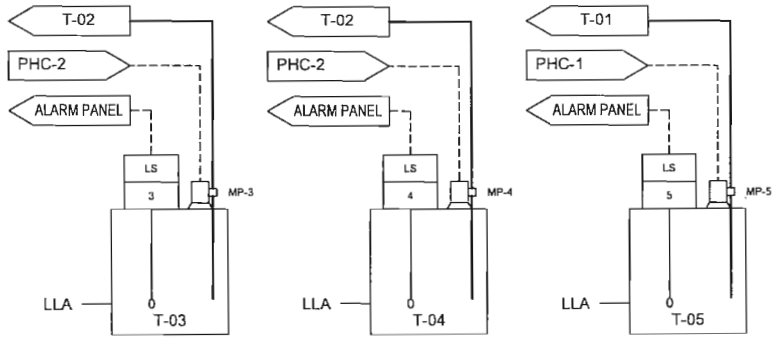
RATING VALUES FOR CLASSIFICATION OF FACILITIES		
UNIT	RATING	SCORE
Aeration mechanical or diffused air greater than 0.5 MGD less than 0.5 MGD		
Aeration: sludge, reaeration		
Aeration: pure oxygen greater than 0.5 MGD		
BOD Removal		
* BOD removal Rating = $\frac{\text{Design BOD in Pounds/Day X "f"}}{1000}$ "f" = 0.3 for primary treatment and 0.8 for secondary or higher facilites		
Carbon Filter		
Carbon Reactivation		
Centrifuge		
Chemical Addition	2	4
Chlorination pre, gas or liquid		
Chlorination post, gas or liquid		
Clarifier, tube setting or inclined plate		
Clariflocculation		
Coagulation and Neutralization		
Comminutation		
Condenser		
Cooling Tower		
Dechlorination		
Denitrification		
Dissolved Air Flotation		
Electrodialysis		
Equalization		
Evaporators		
Extended Aeration; greater than 0.1 MGD less than 0.5 MGD		

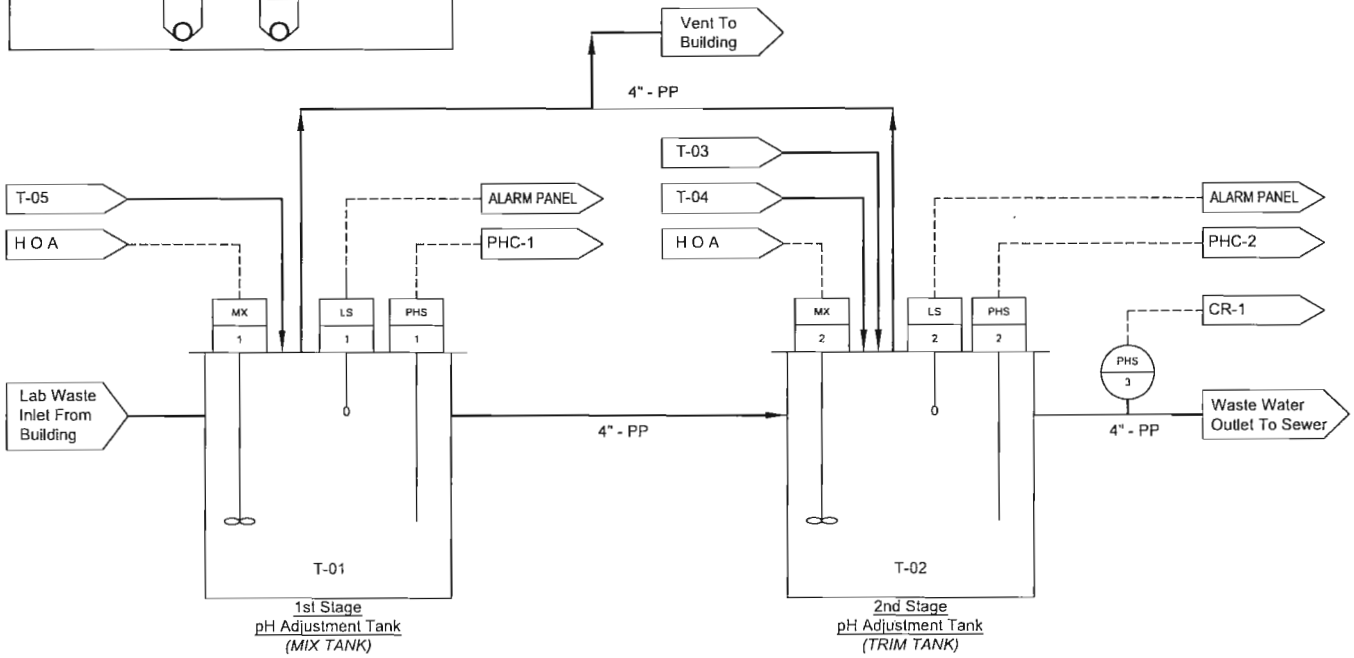
Extended Aeration equal to or less than 0.1 MGD		
Flash Mixing		
Flow measurement		
Flocculation		
Grit Chamber Aerated		
Grit Chamber manually cleaned		
Grit Chamber mechanical grit removal		
Heat Exchangers		
High rate filtration units less than 0.1 MGD greater than 0.1 less than 0.5 MGD greater than 0.5 less than 0.1 MGD greater than 1.0 MGD		
Hypochlorite generation		
Hypochlorination pre and/or post		
Hydrocyclones (grit removal)		
Imhoff tanks		
Incineration		
Ion exchange		
Laboratory		
Land Irrigation, spraying		
Land Irrigation, direct discharge		
Membrane Filtration		
Nitrification		
Odor Control		
Oil Separation		
Oxidation Ditch		
Ozonation		
pH Neutralization System	3-4	4
Polishing Filter		
Post-aeration (cascade)		
Pre-aeration (mechanical)		
Primary Settling; airlift or manual sludge removal		
Primary Settling; mechanical sludge removal		
Primary Sludge holding and mixing		

Pumping (in plant)		
Pumping stations under operator's control		
Reaction vessel		
Reverse Osmosis		
Rotating Biological Contactors		
Rotating Biological Contactors		
Rotary Drum Dryers		
Sand Filters; Multi media, automatic back wash		
Sand Filters; intermittent		
Sand Filters; polishing		
Sand Filters; subsurface		
Screens (mechanical)		
Scum Concentrator		
Secondary Settling; airlift or manual sludge removal		
Secondary Settling; mechanical sludge removal		
Septage facilities		
Sludge blending		
Sludge Composting		
Sludge drying Beds		
Sludge digestion; aerobic		
Sludge digestion; heated and mixed anaerobic		
Sludge digestion; heated and unmixed, anaerobic		
Sludge digestion; unheated		
Sludge elutriation		
Sludge incinerators		
Sludge press; belt		
Sludge press; plate and frame		
Sludge thickeners: floatation		
Stabilization ponds; non-aerated		
Stabilization ponds; aerated		
Stripping; air or steam		
Trickling Filters; high rate		
Trickling, Filters; staged		

Trickling Filters; standard rate	2	
Ultraviolet disinfection	2-5	
Vacuum Filter	10	
Wet Air Oxidation	10	
Board Policy:		
Board Policy:		
Comments: The sum of the cumulative points is 8; however, since these process operations are all encompassed under "pH adjustment system" the score should be 3 or 4 according to the Board Policy accpeted Jan. 13, 1994.		







LEGEND

= METERING PUMP

PHS = PH SENSOR

PHC = PH CONTROLLER

LS = LEVEL SENSOR

LLA = LOW LEVEL ALARM

MX = MIXER

CR = CHART RECORDER

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
01	Created	TJL	SF	WEB	11-08-06

DRAWING TITLE:

Building 20
Dual Stage pH Adjustment System

CLIENT:

Tufts Cummings School of Veterinary Medicine

JOB LOCATION:

Grafton, MA

NORTH

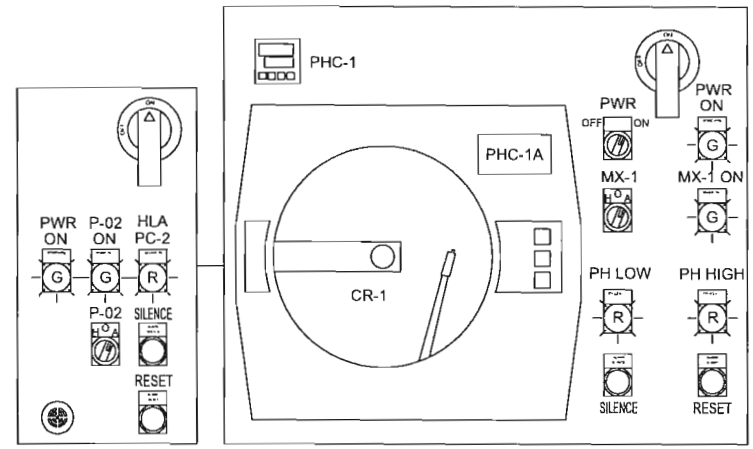
Capaccio
Environmental Engineering, Inc.
293 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

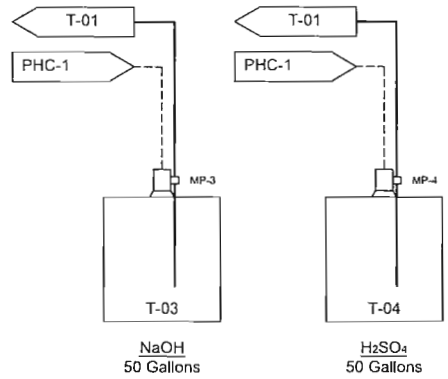
JOB NUMBER: 06-046

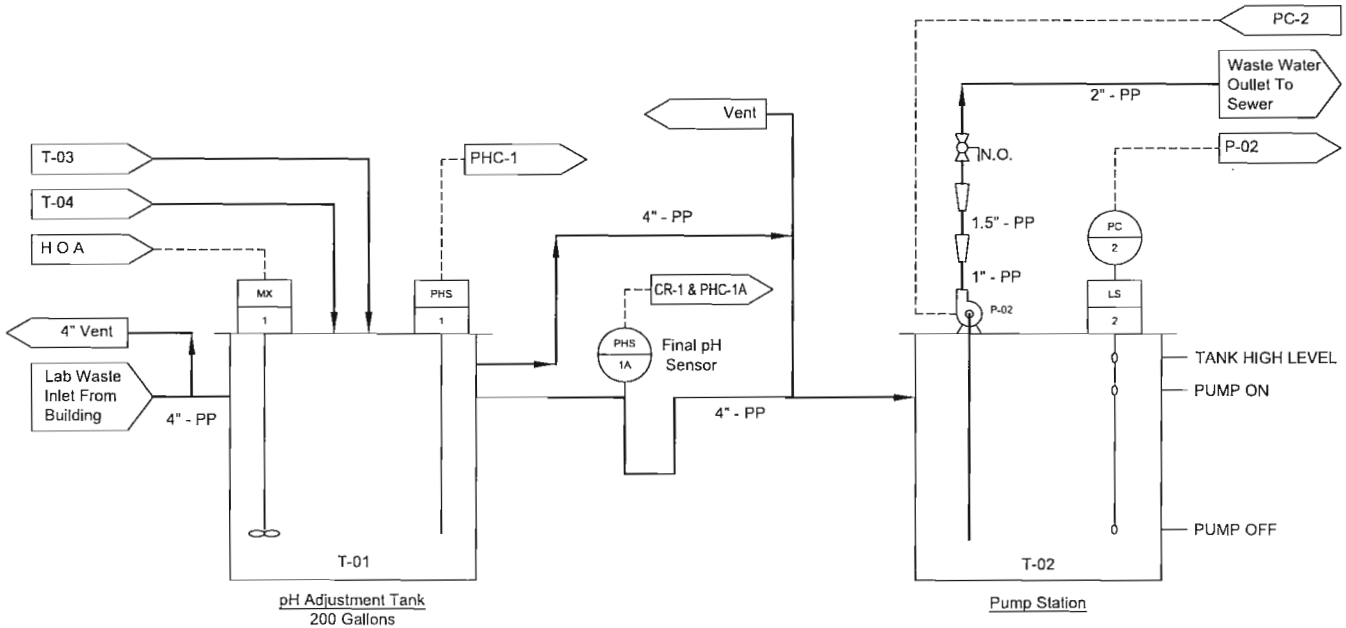
SCALE: NTS

SIZE: B

SHEET: PFD-20-1







LEGEND

PC = PUMP CONTROLLER
PHC = PH CONTROLLER
PHS = PH SENSOR
MX = MIXER
HLA = HIGH LEVEL ALARM
LLA = LOW LEVEL ALARM
CR = CHART RECORDER
LS = LEVEL SENSOR

= METERING PUMP
= VALVE
= TRANSFER PUMP
= REDUCER

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
01	Created	TJL	SF	WEB	10-30-06

DRAWING TITLE:
Building 21 - Single Stage pH Adjustment System

CLIENT:
Tufts Cummings School of Veterinary Medicine

JOB LOCATION:
Grafton, MA

NORTH

Capaccio Environmental Engineering, Inc.
293 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

JOB NUMBER: 06-046
SCALE: NTS
SIZE: B
SHEET: PFD-21-1

Attachment C-3
Building 21 – pH Neutralization System (IWPS – 2)

Enclosed as Attachment C-3 is the following information provided by the equipment manufacturer;

- Description of operations
- Equipment list

Tufts University
Building 21 / Phase II Project
Grafton, Massachusetts

PHS-200C
pH Neutralization System

Description of System and Operation

This pH neutralization system operates on a continuous, flow-through basis. The system accepts incoming streams of aqueous solutions and discharges treated liquids by gravity flow as new incoming liquid displaces volume in each tank. The liquid enters the neutralization tank and is mixed by a top-entering agitator which rapidly disperses all new incoming liquids (including treatment chemicals) to provide a high degree of uniformity of concentration in the tank. The pH of the liquid in each tank is continuously measured by a sensor immersed in the tank. The sensor is connected to a microprocessor based controller with full bi-directional proportional, integral and derivative control (PID). The controller automatically initiates treatment with the appropriate pump when the measured pH exceeds either of the two (high and low) setpoints for that tank. The controller not only starts and stops the metering pumps, but also directly regulates the pumping rate of each pump. The reagents used are 50 - 93% sulfuric acid and 25 - 50% sodium hydroxide (other concentrations and reagents can be accommodated with minor adjustments).

The discharge from the tank passes through a running u-trap with one extended leg. This trap has a second pH sensor mounted in the trap. With this sensor, the pH of the discharged liquid is monitored continuously after treatment and recorded by a chart recorder. High and low pH alarms are included and will provide both audible and visual alarm indication of either condition.

Tufts University
Building 21 / Phase II Project
Grafton, Massachusetts

PHS-200 C
pH Neutralization System

Equipment List

Quantity	Equipment Description
1	Neutralization Tank, Polyethylene, 200 gallon, 36" dia x 48"h (1) 4" inlet fitting, (1) 3" vent fitting, (1) 4" outlet fitting
1	Mixer, 1/4 HP, 316 stainless steel wetted parts, gear drive mixer
2	Chemical Storage Tanks, 50 gallon, 21" dia x 38" deep
2	Metering Pumps (0.42 gph capacity), with tubing, foot valves, and injection valves
1	Immersion-type pH Electrode Assembly, with fittings, pH electrode and temperature compensation unit
1	In-line, Monitor pH Electrode Assembly, 4" U-trap fitting of polypropylene pipe, pH electrode, and temperature compensation unit
1	Set of fittings and instrumentation connectors for installation
1	Control Panel, NEMA 4 rated, fully wired and pre-tested, with the following equipment: • Process controls, with full, bi-directional, proportional, integral, and derivative (PID) pH control, and direct control outputs to regulate acid and alkali metering pump flow rates • Chart recorder for pH recording • Metering Pump control circuits • System and Mixer On/Off switches • Alarm Silence and Reset buttons with Alarm horn • Alarm annunciation section to show the following conditions: • System On • Mixer On • Outlet pH Low • Outlet pH High

Attachment C-4
Building 20 – Disinfection System (IWPS – 1B)

Enclosed as Attachment C-4 is a letter dated December 5, 2006 to Board of Wastewater Treatment Operators, which contains the following information:

- Building 20 Disinfection System (IWPS – 1B)
    - Description of system
    - Grading report
    - Process flow diagrams

FILE COPY

Capaccio
Environmental Engineering, Inc.

VIA CERTIFIED MAIL RRR 7006 0100 0005 2867 5003

"Helping Industry and the Environment Prosper"

December 5, 2006

Mr. Tom Bienkiewicz
Board of Wastewater Treatment Plant Operators
Massachusetts Department of Environmental Protection
Central Regional Office
627 Main St.
Worcester, MA 01608

RE: Tufts Cummings School of Veterinary Medicine
200 Westboro Road
North Grafton, MA 01536
Industrial Wastewater Pretreatment Facility Grading Report ADDENDUM
Project No. 06-046

Dear Mr. Bienkiewicz:

In a letter dated November 3, 2006 Capaccio Environmental Engineering, Inc. (CAPACCIO) submitted an Industrial Wastewater Pretreatment (WWT) Facility Grading Report on behalf of Tufts Cummings School of Veterinary Medicine (TUFTS). Following the report submittal, it was brought to our attention that an additional wastewater treatment system is in place for the Biosafety Level 3 laboratory in building 20 at the facility. The purpose of this document is to provide additional information in the form of an addendum to the WWT Facility Grading Report submitted on November 3, 2006 on behalf of TUFTS.

A portion of wastewater entering the Building 20 pH adjustment system comes from a Biosafety Level 3 (BL3) laboratory, which is pretreated through a batch disinfection system, also located in Building 20. Diagrams of the system operation are provided in the attached process flow diagrams.

The batch disinfection system is a DCL-80/2-SP as manufactured by Concorp, Inc. The system treats laboratory wastewater with sodium hypochlorite to kill bacteria based organisms in the laboratory wastewater effluent. The system is designed as a sequencing batch type system where the wastewater is treated in one stage while the incoming wastewater is collected in the other stage. The system accepts materials from selected BL3 laboratory sinks via the laboratory wastewater polypropylene drain pipe system and treats it in a sequencing batch cycle. The process operates in four (4) modes: Collection, Treatment/Recirculation, Discharge, and Emergency Collection Mode. The following description provides an example of collection and treatment in Tank T-02, for discussion purposes. However, the system is fully redundant and automated such that all modes can occur in either tank and the system automatically alternates between them.

Collection Mode. Wastewater is collected in one of the two 80 gallon treatment tanks. For purposes of this example, collection/treatment tank T-02 will initially be utilized for collection. Once the liquid level in tank T-02 reaches a preset point as indicated by a tank liquid level switch (LS-L4H), the motorized inlet valve (V-01) is automatically shut and the inlet motorized valve (V-02) to the second tank (T-03) is opened to collect wastewater in that tank. The first

tank (T-02) would then treat and discharge the wastewater while the second tank (T-03) is collecting new wastewater as generated from the BL3 lab. Attached drawing PFD-20-2A provides a flow diagram of the wastewater collection mode.

Treatment/Recirculation Mode. The treatment cycle is started in the appropriate tank (T-02 or T-03) based on liquid level or collection residence time. An ORP sensor (ORP-3) is located in the process recirculation piping loop between the pump discharge (P-03A) and the return piping to the treatment tank. A chemical injection port for injection of sodium hypochlorite is located downstream of the sensor (ORP-3). The metering pump (MP-04) is programmed to add sodium hypochlorite to the recirculating laboratory wastewater until the operator-selected set point is reached. Once the desired ORP level is achieved, the treated wastewater continues to recirculate for 60 minutes. During this time the ORP is continuously monitored. Additional sodium hypochlorite is added, if needed, during this time to maintain the desired ORP set point.

During treatment, the intake control valve (V-01 or V-02) is closed until the cycle has been completed, the tank is drained, and the drain valve (V-09) has been closed. The system inlet piping motorized control valves (V-07 or V-08) are actuated by the PLC based on the liquid high level sensors located in each treatment tank (LS-L4H or LS-L6H). In the event both tanks are full, as indicated by the treatment tank high level sensors, an alarm light and horn will be triggered as well as the common system alarm dry contacts.

The wastewater in the treatment tank is recirculated via a set of two horizontal centrifugal pumps (P-03A or P-03B) to facilitate mixing, ORP sensing and chemical injection. The pumps are designed and piped for redundant operation so that either pump can service either treatment tank. These pumps are designed for approximately 25 gpm flow rate. The recirculation pumps are set for automatic alternation. The recirculation pumps are also automatically set to shut-off at the low level liquid sensor level (LS-3L or LS-L5L). Both pumps are controlled via a Hand/Off/Auto switch at the system control panel. Following completion of wastewater treatment and recirculation, the system is programmed to commence discharge mode when operating automatically. Attached drawing PFD-20-2B provides a flow diagram of the wastewater treatment and recirculation mode.

Discharge Mode. The discharge mode of the treatment cycle can be operator initiated or automatic. Normally TUFTS operates the system in automatic mode in the following fashion: Upon completion of treatment and one-hour recirculation time, the control system opens an electrically actuated control valve (V-09). This allows the recirculation discharge pump (P-03A or P-03B) to direct the contents of the treatment tank (T-02 or T-03) to the drain. When the control system is ready to reset the system for a new treatment cycle, the electrically actuated valve (V-09) automatically closes. Attached drawing PFD-20-2C provides a flow diagram of the wastewater discharge mode.

Emergency Collection Mode. In the event that wastewater is discharged to the BL3 lab floor from a floor spill or from activation of the emergency shower, the disinfection system is equipped with a 370-gallon, vertical rectangular, polypropylene collection tank (T-01). This collection tank is designed to accept wastewater via a floor drain located in the BL3 laboratory. The tank has low and high level float switches (LS-L1L and LS L2H) for alarm and pump actuation. The low level switch (LS-L1L) also functions to protect the transfer pumps from running dry. Wastewater collected in tank T-01 is transferred via a set of two horizontal centrifugal pumps (P-01A and P-01B) to the treatment system for appropriate processing. The transfer pumps are controlled by the system central PLC and the two collection tank level sensors (LS-L1L and LS L2H). The collection tank wastewater is pumped at approximately 5-8 gpm to the receiving treatment tank (T-02 or T-03). Once the receiving treatment tank is full, the

transfer pump is shut-off. Since this is an emergency system, the transfer pumps are set to only pump to the treatment tanks every other treatment cycle to prevent both treatment tanks (T-02 and T-03) from filling. The transfer pumps are set for automatic alternation. The transfer pumps are also automatically set to shut-off at the liquid sensor low level. Both pumps are controlled via a Hand/Off/Auto switch at the system control panel. The high level liquid sensor in the collection tank triggers a high level alarm light and horn as well as trigger the common system alarm dry contacts. Attached drawing PFD-20-2D provides a flow diagram of the emergency wastewater collection mode.

Based on the aforementioned description of WWT system unit operations, we recommend scoring an additional 2 points for TUFTS' wastewater disinfection system. The points represent a hypochlorination unit and pumping operation. When added to the 3 or 4 points for pH adjustment operations from the previous Facility Grading Report submittal, the result is 5 or 6, which represents an overall grading level of 1-I for the wastewater treatment systems located in Building 20.

If you have any questions or require additional information, please call 508-970-0033 extension 34 for Seth Forden or extension 21 for Wayne Bates.

Very truly yours,
Capaccio Environmental Engineering, Inc.
BY:

Seth Forden
Environmental Engineer

Wayne E. Bates, Ph.D., P.E.
Manager, Engineering Group

Enclosures:
1) WWT Facility Grading Report
2) Batch Disinfection System WWT Process Flow Schematics

cc: J. Chilton (TUFTS)
W. Bates (CAPACCIO)
MF (06-046)

Building 20 Disinfection System Addendum

MASSACHUSETTS BOARD OF CERTIFICATION
OF
WASTEWATER TREATMENT PLANT OPERATORS

FACILITY GRADING REPORT

Facility Name: Tufts Cummings School of Veterianary Med.			File No.	
Street Address: 200 Westboro Road				
City/Town: North Grafton		State: MA		Zip: 01536
Telephone: 508-839-7921				
Contact Name and Title: Joe Chilton, Facilities Manager				
Discharge Permit Numbers				
NPDES No.				
Date Received:				
Rating Results:		Date:		Approved:
Industrial or Municipal: Industrial				
Rating Total: 2				
Grade: 1-I				

CLASS	CUMULATIVE RATING VALUE
Class (M or I)	1-7
Class 2 (M or I)	8-20
Class 3 (M or I)	21-30
Class 4 (M or I)	31-50
Class 5	51-65

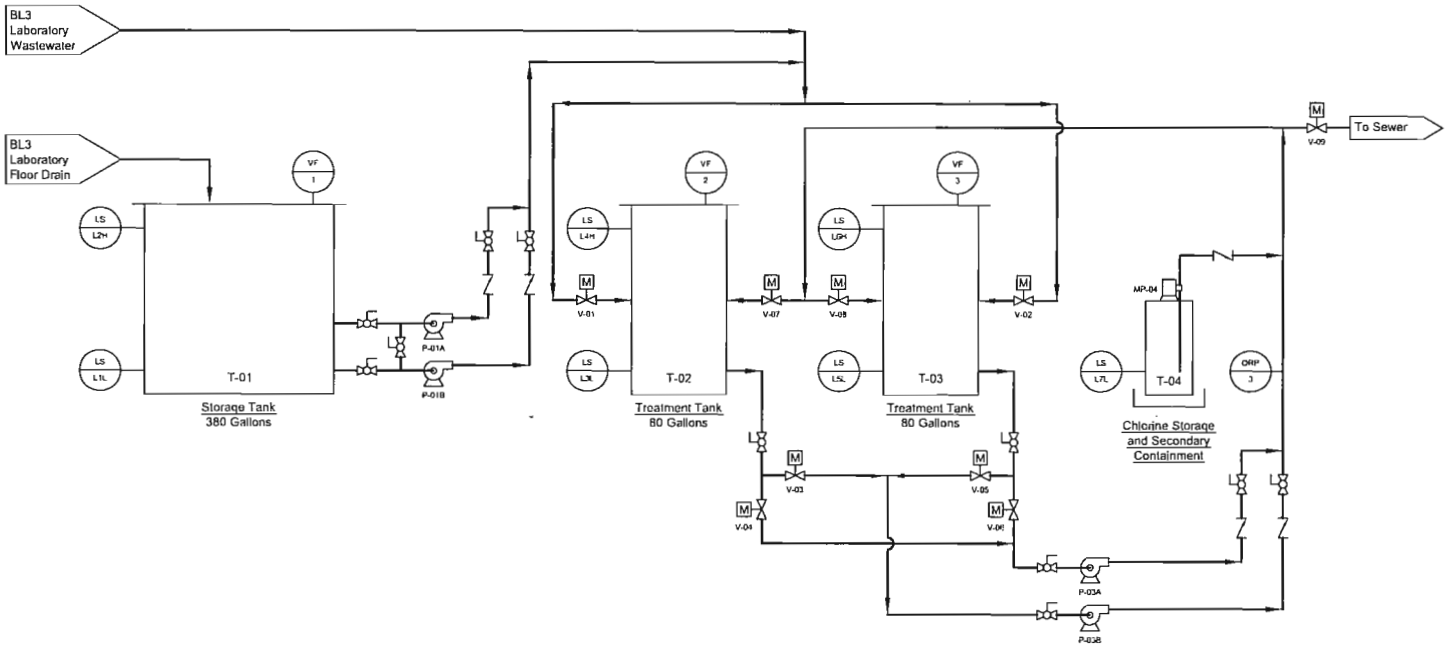
RATING VALUES FOR CLASSIFICATION OF FACILITIES		
UNIT	RATING	SCORE
Aeration mechanical or diffused air greater than 0.5 MGD less than 0.5 MGD		
Aeration: sludge, reaeration		
Aeration: pure oxygen greater than 0.5 MGD		
BOD Removal		
* BOD removal Rating = $\frac{\text{Design BOD in Pounds/Day X "f"}}{1000}$ "f" = 0.3 for primary treatment and 0.8 for secondary or higher facilites		
Carbon Filter		
Carbon Reactivation		
Centrifuge		
Chemical Addition		
Chlorination pre, gas or liquid		
Chlorination post, gas or liquid		
Clarifier, tube setting or inclined plate		
Clariflocculation		
Coagulation and Neutralization		
Comminutation		
Condenser		
Cooling Tower		
Dechlorination		
Denitrification		
Dissolved Air Flotation		
Electrodialysis		
Equalization		
Evaporators		
Extended Aeration; greater than 0.1 MGD less than 0.5 MGD		

Extended Aeration equal to or less than 0.1 MGD		
Flash Mixing		
Flow measurement		
Flocculation		
Grit Chamber Aerated		
Grit Chamber manually cleaned		
Grit Chamber mechanical grit removal		
Heat Exchangers		
High rate filtration units less than 0.1 MGD greater than 0.1 less than 0.5 MGD greater than 0.5 less than 0.1 MGD greater than 1.0 MGD		
Hypochlorite generation		
Hypochlorination pre and/or post	1	1
Hydrocyclones (grit removal)		
Imhoff tanks		
Incineration		
Ion exchange		
Laboratory		
Land Irrigation, spraying		
Land Irrigation, direct discharge		
Membrane Filtration		
Nitrification		
Odor Control		
Oil Separation		
Oxidation Ditch		
Ozonation		
pH Neutralization System		
Polishing Filter		
Post-aeration (cascade)		
Pre-aeration (mechanical)		
Primary Settling; airlift or manual sludge removal		
Primary Settling; mechanical sludge removal		
Primary Sludge holding and mixing		

Pumping (in plant)		
Pumping stations under operator's control	1	1
Reaction vessel		
Reverse Osmosis		
Rotating Biological Contactors		
Rotating Biological Contactors		
Rotary Drum Dryers		
Sand Filters; Multi media, automatic back wash		
Sand Filters; intermittent		
Sand Filters; polishing		
Sand Filters; subsurface		
Screens (mechanical)		
Scum Concentrator		
Secondary Settling; airlift or manual sludge removal		
Secondary Settling; mechanical sludge removal		
Septage facilities		
Sludge blending		
Sludge Composting		
Sludge drying Beds		
Sludge digestion; aerobic		
Sludge digestion; heated and mixed anaerobic		
Sludge digestion; heated and unmixed, anaerobic		
Sludge digestion; unheated		
Sludge elutriation		
Sludge incinerators		
Sludge press; belt		
Sludge press; plate and frame		
Sludge thickeners: floatation		
Stabilization ponds; non-aerated		
Stabilization ponds; aerated		
Stripping; air or steam		
Trickling Filters; high rate		
Trickling, Filters; staged		

Trickling Filters; standard rate		
Ultraviolet disinfection		
Vacuum Filter		
Wet Air Oxidation		
Board Policy:		
Board Policy:		
Comments: The sum of the cumulative points is 2. This includes only the disinfection system and represents an addition to the previous submittal.		

WASTEWATER COLLECTION MODE



LEGEND

- L#H = HIGH LEVEL ALARM
- L#L = LOW LEVEL ALARM
- ORP = OXIDATION-REDUCTION POTENTIAL SENSOR
- VF = VENT FILTER
- = TRANSFER PUMP
- = MOTOR OPERATED VALVE
- = CHECK VALVE
- = VALVE
- = METERING PUMP
- = FLOW PATH

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
02	Progress Print	TJL	SF	WEB	11-13-06
01	Created	TJL	SF	WEB	10-19-06

DRAWING TITLE:
Building 20
Wastewater Disinfection System

CLIENT:
Tufts Cummings School
of Veterinary Medicine

JOB LOCATION:
Grafton, MA

NORTH

Capaccio
Environmental Engineering, Inc.
293 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

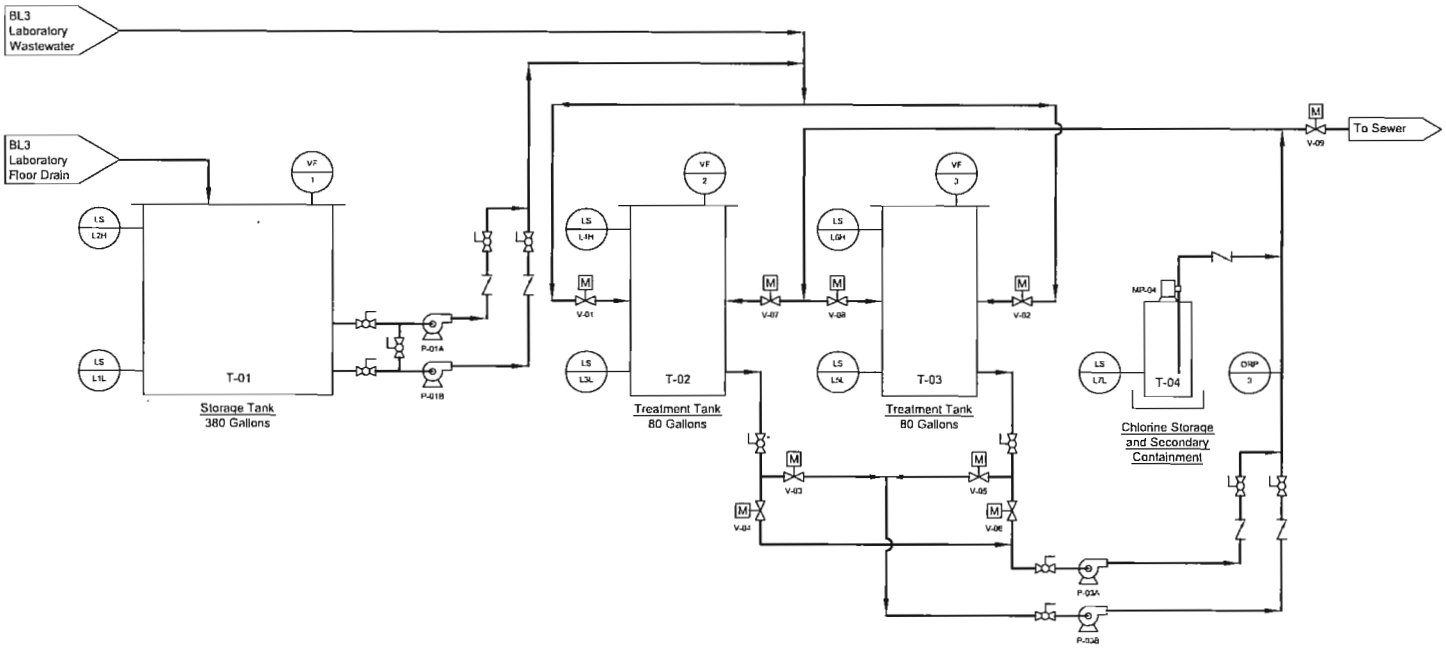
JOB NUMBER: 06-046

SCALE: NTS

SIZE: B

SHEET: PFD-20-2A

WASTEWATER TREATMENT AND RECIRCULATION MODE



LEGEND

L#H = HIGH LEVEL ALARM

L#L = LOW LEVEL ALARM

ORP = OXIDATION-REDUCTION POTENTIAL SENSOR

VF = VENT FILTER

= TRANSFER PUMP

= MOTOR OPERATED VALVE

= CHECK VALVE

= VALVE

= METERING PUMP

= FLOW PATH

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
02	Progress Print	TJL	SF	WEB	11-13-06
01	Created	TJL	SF	WEB	10-19-06

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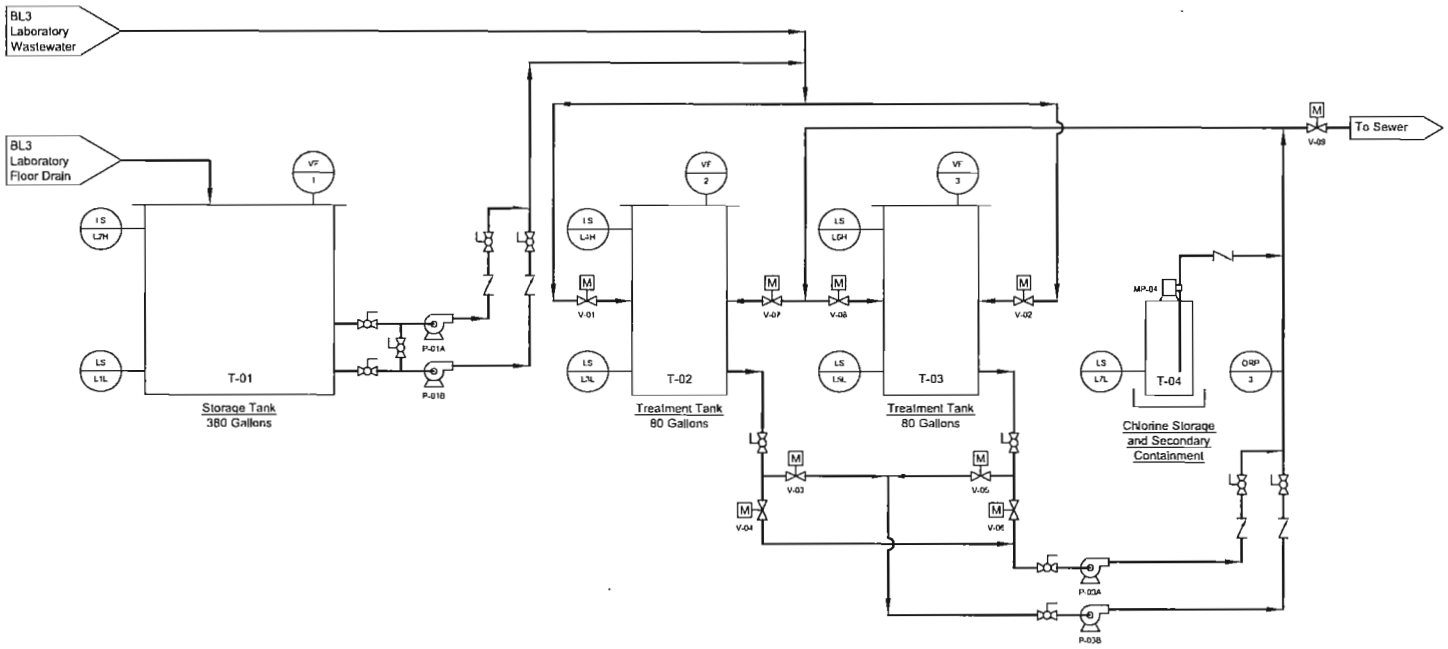
JOB NUMBER: 06-046

SCALE: NTS

SIZE: B

SHEET: PFD-20-2B

WASTEWATER DISCHARGE MODE



LEGEND

- L#H = HIGH LEVEL ALARM
- L#L = LOW LEVEL ALARM
- ORP = OXIDATION-REDUCTION POTENTIAL SENSOR
- VF = VENT FILTER
- = TRANSFER PUMP
- = MOTOR OPERATED VALVE
- = CHECK VALVE
- = VALVE
- = METERING PUMP
- —— = FLOW PATH

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
02	Progress Print	TJL	SF	WEB	11-13-06
01	Created	TJL	SF	WEB	10-19-06

DRAWING TITLE:
Building 20
Wastewater Disinfection System

CLIENT:
Tufts Cummings School of Veterinary Medicine

JOB LOCATION:
Grafton, MA

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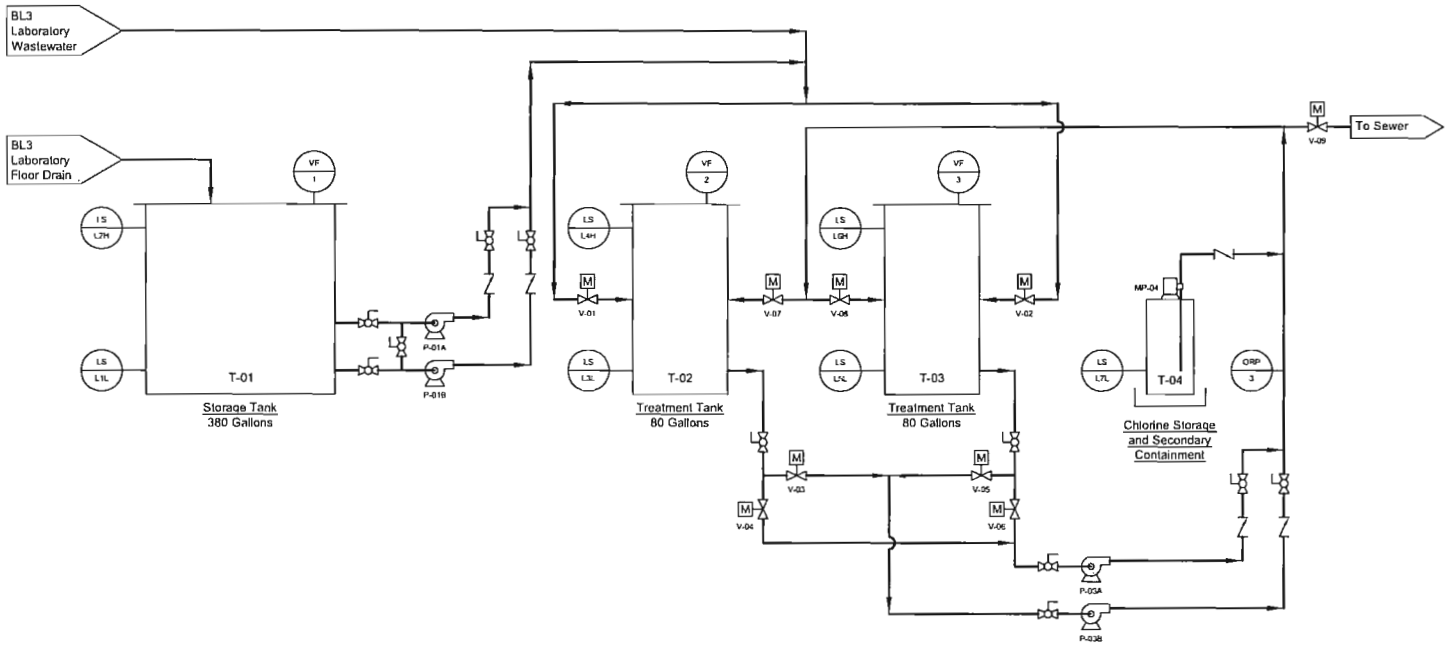
JOB NUMBER: 06-046
SCALE: NTS
SIZE: B
SHEET: PFD-20-2C

EMERGENCY COLLECTION MODE



LEGEND

L#H = HIGH LEVEL ALARM

L#L = LOW LEVEL ALARM

ORP = OXIDATION-REDUCTION POTENTIAL SENSOR

VF = VENT FILTER

= TRANSFER PUMP

= MOTOR OPERATED VALVE

= CHECK VALVE

= VALVE

= METERING PUMP

= FLOW PATH

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
01	Created	TJL	SF	WEB	12-04-06

DRAWING TITLE:

Building 20 Wastewater Disinfection System

CLIENT:

Tufts Cummings School of Veterinary Medicine

JOB LOCATION:

Grafton, MA

NORTH

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"Helping Industry and the Environment Prosper"

JOB NUMBER: 06-046

SCALE: NTS

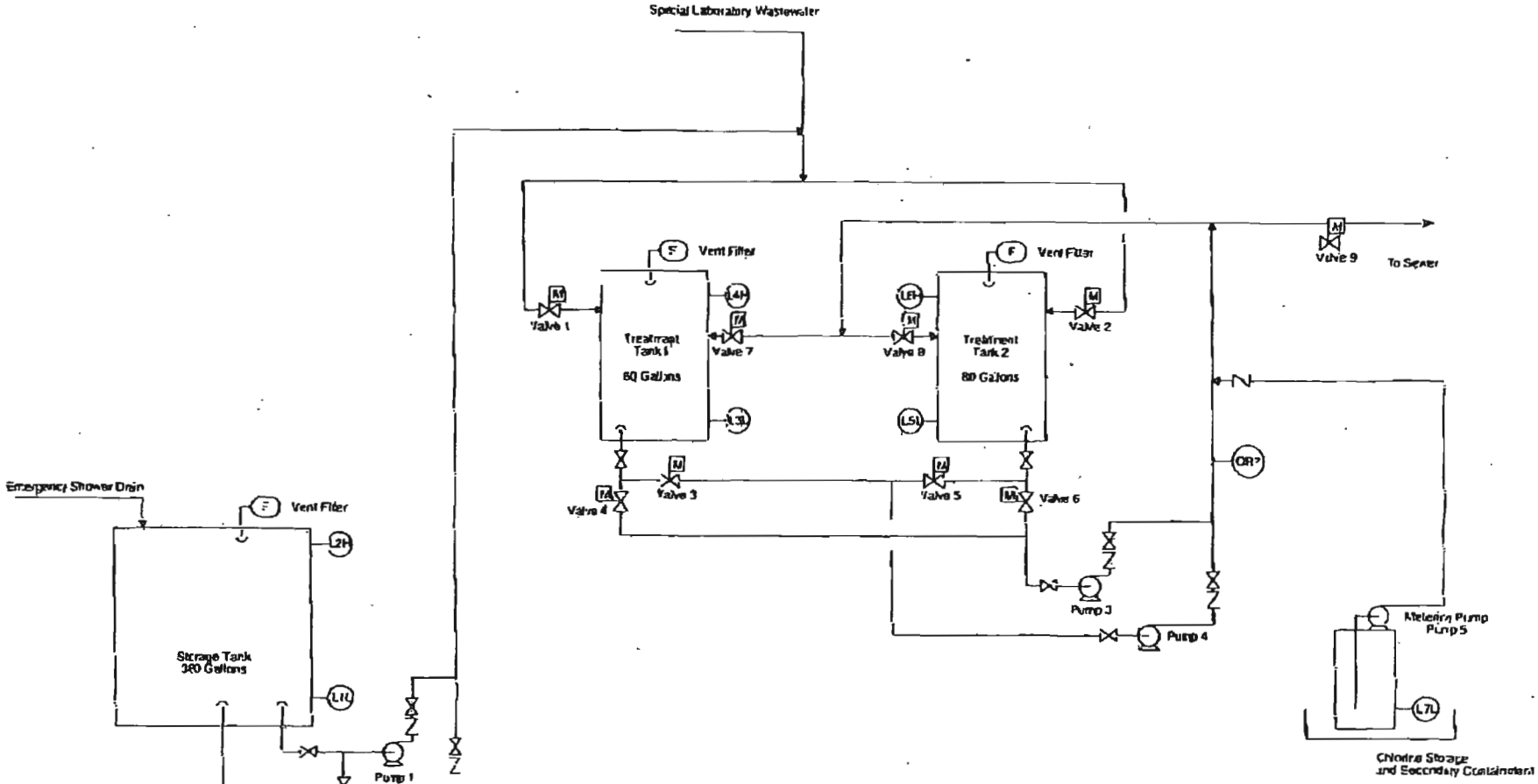
SIZE: B

SHEET: PFD-20-2D

Attachment C-5
Building 20 – Disinfection System (IWPS – 1B)

Enclosed as Attachment C-5 is the following information as provided by the equipment manufacturer Concorp for the disinfection system IWPS-1B:

- Process flow diagram
- Description of system
- Equipment List



Concorp, Inc.	Wastewater Treatment System Process Schematic	Drawing No.: 2082 Page No.: Page 1 of 1 Revision: v 1.0
	Tufts University	Date: 12/16/08 Order Number:
		By: J.F.C.
		Scale: N.T.S.

Concorp Process System DCL-80/2-SP
Batch Decontamination Process

Description of System and Operation

This system treats batches of laboratory wastewater with sodium hypochlorite to kill bacteria based organisms in the laboratory wastewater effluent. The system is designed as a batch type system where the wastewater is treated in one stage while the incoming wastewater is collected in the other stage. The system accepts material from selected laboratory sinks, via the laboratory wastewater polypropylene drain pipe system. The liquid is stored in the treatment tank until the the treatment tank is full and ready to process the wastewater. The typical holding capacity volume of material in each treatment tank is approximately 80 gallons. Once the tank liquid level reached a preset point, as indicated by a tank liquid level switch in the tank, the inlet motorized valve is automatically shut. Once the first tank is filled, the inlet motorized valve to the second tank is opened to start collection of the influent wastewater. The second treatment tank is designed to collect the wastewater while the wastewater is treated in the first treatment stage. Upon completion of the treatment cycle in the first tank and filling of the second treatment tank, the motorized valves automatically redirect the incoming wastewater to the first tank to allow the second treatment stage to process the batch collected wastewater. The system is designed for automatic collection and treatment of the laboratory wastewater based on this batch treatment cycle operation.

Based on treatment tank liquid level or collection residence time, the treatment cycle is started in the appropriate treatment tank. An ORP sensor is located in the process recirculation piping loop between the pump discharge and the return piping to the treatment tank. An injection port is located downstream from the sensor for chemical injection of the chemical reagent. The recirculation pump runs until the ORP setpoint is achieved and then maintained for a operator set period of time. The system will add sodium hypochlorite (chlorine) to the collected laboratory wastewater to produce a solution ORP at the operator selected setpoint. When the desired concentration is achieved, the material is held for a minimum period of 60 minutes. During this time the wastewater is continuously being recirculated and the ORP measured with chemical feed as required to maintain the desired ORP setpoint. After this treatment stage period, the system can hold the material for operator testing or the system can be set for automatic discharge to the drain system.

The drain-down and discharge stage of the cycle is selectable as either operator initiated or automatic based on the above control system. Upon actuation, the control system opens an electrically actuated control valve to allow the recirculation/discharge pump to direct the contents of the treatment tank to the drain. When the control system is ready to reset the system for another treatment cycle, the electrically actuated valve will close automatically.

During the treatment cycle, the system will not accept additional material for treatment. The intake control valve is closed until the cycle has been completed, the tank is drained, and the drain valve has been closed. The system is designed so that the liquid is collected and then treated as a batch system. This is accomplished via two automatic motorized valves in the inlet suction piping from the treatment tanks to the recirculation/discharge pumps. The system inlet piping motorized control

valves are actuated by the PLC based on the liquid high level switches located in each treatment tank. In the event both tanks are full, as indicated by the treatment tank high level sensors, an alarm light and horn will be trigger as well as the common system alarm dry contacts.

This wastewater in the treatment tank is recirculated for mixing, ORP sensing and chemical injection via a set of two horizontal centrifugal pumps to the the treatment system. These pumps are designed for approximately 25 gpm flowrate. The recirculation pumps are set for automatic alternation. The recirculation pumps are also automatically set to shut-off at the low level liquid sensor level. Both pumps will be controlled via a Hand/Off/Auto switch at the system control panel. The pumps are designed and piped for redundant operation so that either pump can service either treatment tank.

The system has a 370 gallon polypropylene vertical rectangular collection tank for the emergency shower drain system. This collection tank is designed to accept the wastewater via a gravity feed. The tank has low and high level float switches for alarm actuation. The low level switch also functions to protect the transfer pumps from running dry. The collected laboratory wastewater is transferred via a set of two horizontal centrifugal pumps to the the treatment system for appropriate processing. The transfer pumps are controlled by the system central PLC and the two collection tank level sensors. The collection tank wastewater is pumped at approximately 5-8 gpm via a transfer pump to the receiving treatment tank. Once the receiving treatment tank is full the transfer pump is shut-off. Since this is an emergency system, the transfer pumps are set to only pump to the treatment tanks every other treatment cycle to prevent filling both treatment tanks so that no other process wastewater can by collected. The transfer pumps are set for automatic alternation. The transfer pumps are also automatically set to shut-off at the low level liquid sensor level. Both pumps will be controlled via a Hand/Off/Auto switch at the system control panel. The high level liquid sensor in the collection tank will trigger a high level alarm light and horn as well as trigger the common system alarm dry contacts.

Tufts University Veterinary Medicine, Grafton, Bldg 20

Grafton, Massachusetts

Batch Decontamination Process System

Equipment List

Quantity	Equipment Description
1	Collection Tank, vertical rectangular closed top, polypropylene, 370 gallon nominal capacity, 34" x 38" x 66"h, with epoxy coated steel stand
2	Treatment Tank, totalized enclosed, molded polyethylene, 80 gallon nominal capacity, 34" dia x 44"h, with epoxy coated steel stand
2	Inlet Control Valves, 3" polypropylene, with electric actuator
3	Pump Discharge Valves, 1" polypropylene, with electric actuator
4	Pump Suction Valves, 1-1/2" polypropylene, with electric actuator
1	Sodium Hypochlorite Metering Pump (5 gph capacity), with tubing, foot valve, injection valve and polypropylene wall mounting shelf
1	Chemical Containment Tank, 30 gallon, for secondary containment of chemical drum
1	ORP Process Controller, panel mounted ORP analyzer/controller
1	ORP Sensor, piping mounting assembly and cable
2	Transfer Pump, magnetic drive, 1/4 HP, GFRPP construction Little Giant Model TE-4-MD-HC, rated at 8 gpm @ 15' THD
2	Recirculation Pump, magnetic drive, 1/3 HP, GFRPP construction Little Giant Model TE-5.5-MD-HC, rated at 28 gpm @ 15'TDH
4	Sets of pump inlet ball valves, outlet ball and ball check valves
3	Sets of tank 0.2 micron sterile filter elements and mounting manifold for collection tank and treatment tank chamber vents
1	System Skid, 34" x 96" epoxy coated steel skid for treatment tanks and pumps

Tufts University Veterinary Medicine, Grafton, Bldg 20

Grafton, Massachusetts

Batch Decontamination Process System

Equipment List (Continued)

Quantity	Equipment Description
1	Control Panel, NEMA 4 rated, fully wired and pre-tested, with the following equipment:

- Programmable Logic Controller (PLC)
- PLC interface for operator inputs
- system On/Off switch
- transfer pumps Hand/On/Off switches
- recirculation pumps Hand/On/Off switches
- transfer pump pump control circuits
- recirculation/discharge pump control circuits
- metering pump control circuit
- alarm horn with alarm silence and reset buttons
- alarm and annunciation section to show the following conditions:
  - System On
  - Recirculation Pump 1 On
  - Transfer Pump 1 On
  - Treatment Tank 1 Active
  - Treatment Tank 1 Filled
  - Treatment Tank 2 Filled
  - Treatment Tank 1 Discharging
  - Pump motor starter tripped alarm
  - ORP Meter Alarm
  - Collection Tank Low Water Alarm
  - Collection Tank High Water Alarm
  - System General Alarm
  - Recirculation Pump 2 On
  - Transfer Pump 2 On
  - Treatment Tank 2 Active
  - Treatment Tank 1 Operating
  - Treatment Tank 2 Operating
  - Treatment Tank 2 Discharging